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ADULT EDUCATION AND THE ADOPTION OF INNOVATIONS BY
ORCHARDISTS IN THE OKANAGAN VALLEY OF BRITISH COLUMBIA.

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BRITISH COLUMBIA UNIV., VANCOUVER

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THIS STUDY ANALYZED THE GENERAL BEHAVIOR OF ORCHARDISTS
IN THE OKANAGAN VALLEY, BRITISH COLUMBIA, AND THE FACTORS
RELATED TO ADOPTION OF INNOVATIONS IN THIS SETTING. FIVE
PERCENT SAMPLES WERE DRAWN FROM 19 DISTRICTS CONSISTING OF
2,721 ORCHARDS, AND DATA WERE GATHERED BY RESIDENT
AGRICULTURISTS. THE DATA WERE ANALYZED BY STAGE IN THE
ADOPTION PROCESS IN ADOPTER CATEGORIES OF--(1) INNOVATORS,
EARLY ADOPTERS, AND BY INDIVIDUAL CHARACTERISTICS SUCH AS
AGE, EDUCATIONAL LEVEL, INCLUDING ADULT EDUCATION EXPERIENCE
AND TENURE, (2) COMMUNITY PARTICIPATION, AND ECONOMIC
CHARACTERISTICS, INCLUDING SIZE OF THE ENTERPRISE AND
FINANCIAL STATUS, AND (3) COMMUNITY ATTITUDES ABOUT THE
ACCEPTANCE OR REJECTION OF INNOVATIONS AS PERCEIVED BY THE
RESPONDENTS. THE ORCHARDISTS HAD ACCESS TO NEW INFORMATION
FROM COMMERCIAL ENTERPRISES IN EQUIPMENT AND SUPPLIES,
COOPERATIVE MARKETING ORGANIZATIONS, A FEDERAL RESEARCH
STATION, BUT MOST SYSTEMATICALLY FROM THE DISTRICT
HORTICULTURISTS, WHO PROVIDED PERSONALIZED SERVICES,
CONDUCTED MEETINGS, AND PLANNED INSTRUCTIONAL PROGRAMS. SEVEN
INNOVATIONS PRESENTED THROUGH A 1964 TV CHAUTAUQUA OR
INTRODUCED PREVIOUSLY WERE COMPARED. EARLY ADOPTERS SHOWED
ABOVE AVERAGE ECONOMIC STATUS AND EDUCATIONAL PARTICIPATION,
A HIGHER PROPORTION OF FULL-TIME ORCHARDISTS, GREATER CIVIC
PARTICIPATION, AND MORE USE OF MASS MEDIA, PERSONAL CONTACTS,
AND AGRICULTURAL AGENCIES. THIS DOCUMENT IS ALSO AVAILABLE
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**ADULT EDUCATION
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**ADULT EDUCATION AND THE ADOPTION OF INNOVATIONS BY
ORCHARDISTS IN THE OKANAGAN VALLEY OF BRITISH COLUMBIA**

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1966**

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PREFACE

In the Spring of 1964, the Provincial Horticulturist, Mr. Charles Carter, requested an evaluation of a special television series conducted by the British Columbia Department of Agriculture for the fruit growers in the Okanagan Valley. The report of that study herewith has exceeded Mr. Carter's original request. In so doing, the study has analyzed the general behavior of orchardists and the factors related to adoption in this particular setting.

The authors are indebted to Mr. Carter for the initial grant in support of part of the study. We are indebted to those resident agriculturists in the Okanagan Valley who collected the data from their clientele. Dr. J.J. Richter of the Department of Agricultural Economics, University of British Columbia provided guidance and administrative support for this study. The Faculty of Education and the Department of University Extension provided assistance to complete the study.

*Coolie Verner,
Frank W. Millerd.*

*Vancouver, B.C.,
Spring, 1966.*

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CHAPTER ONE

THE STUDY

The progressive improvement of Canadian agriculture occurs at an unequal rate. At the moment, ten percent of the farms occupying twenty-three percent of the farm land account for forty-five percent of the value of products sold. Conversely, forty-six percent of the farms on twenty-seven percent of the land account for only ten percent of the value of farm products sold.¹ Such disparity in agricultural efficiency results in a disproportionately large segment of the rural farm population which must exist on a sub-marginal level of economic achievement.

The differences in productivity among Canadian farmers result from a number of variable influences among which is the rate at which farm operators accept or reject agricultural innovations. New ideas and practices affecting agricultural efficiency are produced continuously as agricultural technology advances and these innovations touch every aspect of the farming enterprise from soils to marketing and seeds to machinery. Such innovations are meaningless, however, until the farmer accepts and integrates them into his on-going operations on his farm. The acceptance or rejection of innovations is influenced by the characteristics of the farmer as a person, the nature of his agricultural operations, and the ways in which information about new practices is made available to him. Thus, one important aspect of the improvement of agricultural production is the diffusion of information to farmers and the ways in which they respond to it.

PURPOSE OF THE STUDY

This study was designed to analyze the diffusion process as it functions with a specific Canadian agricultural population

1. Helen C. Abell and Noel A. Lyon, "The Social Consequences of the Modernization of Agriculture." in Proceedings: Symposium on Rural Sociology. Ottawa: Agricultural Economics Research Council of Canada, 1966.

and to relate it to general theory and research about the diffusion of information and the acceptance of agricultural innovations. To do so, the adoption behavior of a sample of orchardists was computed by studying innovations introduced in the five years preceding the study. With this as a basis for analysis, the behavior of the sample in response to a television program designed specifically for them was measured in the same terms.

THE SETTING

One of the principal tree fruit growing areas in Canada is in the Okanagan Valley in British Columbia. This valley stretches northward from the southern border of the province a distance of some one hundred miles and it is bounded on the west by the Cascade Range and on the east by the Gold Range. These two ranges of mountains protect the valley from cold weather systems which allows the lowest monthly mean temperature to hover at twenty-six degrees Fahrenheit. The four summer months have mean temperature ranges in the high sixties.

The valley is in the dry belt and has an average annual rainfall of 14.63 inches which is insufficient for the natural growth of fruit trees. Irrigation is necessary, therefore, and was started in 1866. The first commercial orchards were planted in 1892 on the Coldstream Ranch near Vernon. About 92.5 percent of all the fruit grown commercially in the province is produced in the Okanagan Valley. This constitutes slightly over ten percent of the farm cash income of the province. This fruit crop is produced by 2,790 growers with over two million trees. Orchards range in size from one acre to over three hundred. The fruits grown include apples, which constitute over sixty percent of the fruit crop; pears and peaches at about ten percent each; cherries, eight percent; apricots, six percent; prunes, four percent; and crabapples and plums both less than one percent.

The population of the Okanagan Valley was approximately 85,000 in 1961 with eighteen percent living on farms. The

bulk of the population is concentrated in three major urban centers: Vernon with a population in 1961 of 10,250; Kelowna with 13,188; and Penticton with 13,850.

SAMPLE

The British Columbia Department of Agriculture conducted a survey of all orchards in the Okanagan Valley in 1960. This survey divides the valley into 23 districts with a total of 2,790 orchards. It also supplies data on the variety and number of trees on each orchard. Four of these districts with a total of 69 orchards were eliminated from the study because of their isolation. The remaining 19 districts consisting of 2,721 orchards constituted the universe of the study.

A five percent sample of the orchards from each district was drawn from the universe using a table of random numbers. The sample was tested for representativeness by comparing the sample with the universe in terms of the number of trees per orchard overall, by variety, and by district. None of the sample averages correspond precisely with their respective universe although the sample average of 860.86 trees per orchard was close to the universe average of 857.88 trees per orchard.

The normal curve was used to compare the means overall and by variety while the t-distribution was used in comparing means by district. There was no significant difference between the sample and the population in mean number of trees per orchard. By variety, a significant difference was shown between the sample and the universe in two varieties only. Since the study was not concerned with varieties specifically this difference was adjudged unimportant. In calculating the mean number of trees per orchard by district, those districts which had a sample size of less than five orchards were consolidated. The test by district indicated that there were significant differences in the number of trees per orchard between the sample and the universe in districts number 11, 16, 17-19, and 23. These data are shown on Table One. In view of this, no

TABLE ONE
COMPARISONS OF SAMPLE AND POPULATION MEAN NUMBER OF
TREES PER RESPONDENT BY DISTRICT

Number	District Name	Sample Mean	Population Mean	t Value	t .025*
3,5,6	Salmon Arm, B.X., and Vernon	855.00	680.83	1.2576	2.228
7,9	Coldstream and Oyama	677.33	825.57	-1.0179	-2.306
10	Okanagan Center and Winfield	2,083.50	900.93	1.0205	2.365
11	Kelowna	785.21	1,097.00	<u>-2.7033</u>	-2.069
12,13	Westbank and Peachland	1,294.58	925.22	1.7684	2.201
14	Summerland	576.18	659.98	- .7156	-2.120
15	Naramata	649.60	899.77	-1.3503	-2.776
16	Penticton	479.36	792.32	<u>-3.3874</u>	-2.228
17,18, 19	Penticton, Westbank, Kaleden, Okanagan Falls	246.67	562.33	-4.0248	-2.306
20	Keremeos	789.17	635.37	.9685	2.571
21	Cawston	831.20	1,026.57	- .6355	-2.776
22	Oliver	1,280.75	878.46	1.8466	2.131
23	Osoyoos	629.83	988.51	<u>-3.5237</u>	-2.201

NOTE: Underlined values indicate significant differences between population and sample means. An .05 level of significance was used to test the null hypothesis that the sample mean is equal to the population mean. The criterion used in testing the null hypothesis was to reject the hypothesis if $t < -t_{.025}$ or $t > t_{.025}$, accept the hypothesis if $-t_{.025} \leq t \leq t_{.025}$ where $t = \frac{\bar{x} - \mu}{s/\sqrt{n}}$ (\bar{x} = sample mean, μ = population mean, s = standard deviation of the sample, n = sample size), $t_{.025}$ is given using $n-1$ degrees of freedom.

* from Table 2 of J.F. Freund and F.J. Williams, Modern Business Statistics, Englewood Cliffs, Prentice-Hall, 1958.

analysis of the data was made by district. Such an analysis was not essential to the basic purpose of the study and since the total sample did not differ significantly in the tree population from the total universe, the sample is presumed to provide a valid representation of the orchards in the Okanagan Valley.

PROCEDURE

Data Collection

The data were gathered by personal interviewers using a prepared schedule. The resident District Horticulturists and District Agriculturists were used as interviewers. They were instructed to interview the decision makers on the orchards drawn in the sample. The interview schedule was complex and required approximately forty-five minutes to complete. A one day training session was held to acquaint the interviewers with the schedule and to standardize procedures and responses as far as possible.

The use of this resident field staff of the Department of Agriculture was unavoidable and undoubtedly introduced some bias in certain aspects of the study as will be noted later. The extent of this bias cannot be determined precisely.

The field interviews were conducted during the week of April 13 to 17, 1964.

Data Analysis

The completed schedules were edited and the data analyzed using electronic data processing equipment during the winter term of 1964-1965. The basis analysis of the data was made in terms of the adoption scores which were computed for each respondent and from which were derived the stages in the adoption process and the adopter categories as is consistent with previous research.

The Adoption Process

The acceptance or rejection of an innovation is not a simple dichotomy of behavior but involves instead a complex sequence of mental activity which has been segregated into

five specific stages. Lionberger summarizes the research and identifies the following stages:¹

1. Awareness. The stage at which an individual first learns of an innovation. Lack of awareness was recorded as stage zero.
2. Interest. The stage at which an individual actively seeks further information about the innovation.
3. Evaluation. In which an individual weighs and sifts information in light of the suitability and advantage of the innovation to his own operation.
4. Trial. The tentative acceptance of an innovation to assess more fully its utility and appropriateness.
5. Adoption. The acceptance of the innovation and its integration into the behavior of the individual.

In determining the stage in the adoption process each respondent identifies his own stage with respect to each innovation in response to questions posed on the schedule. These stages are particularly useful in appraising the relative utility of various aspects of the informational process and in determining the process of an innovation toward adoption.

Adopter Categories

Since different individuals respond to innovations differently it is possible to categorize a given population on a 'time of adoption' scale. Rogers has shown that this distribution will approximate a normal curve.² The time of adoption scale has been partitioned into five adopter categories:

Innovators, who are the first to accept an idea or practice;

1. Herbert F. Lionberger, Adoption of New Ideas and Practices. (Ames, Iowa, Iowa State University Press, 1960). p.3. See also: Everett M. Rogers, Diffusion of Innovations. (N.Y.: Free Press of Glencoe, 1962). pp.81-86, for a more detailed analysis.

2. Rogers, op.cit. pp.152-158.

Early Adopters; Early Majority; and Laggards, who are the last to accept or else who never accept at all.¹

TABLE TWO
CLASSIFICATION OF RESPONDENTS INTO ADOPTER CATEGORIES

Adopter Category	Boundaries	Number of Standard Deviations from the Mean	Respondents in Category	
			Number	Percent
Innovators	91.004	+2	1	0.7
Early adopters	70.909	+1	19	13.1
Early majority	50.814	0	59	40.7
Late majority	30.720		43	29.7
Laggards			23	15.9
TOTAL			145	100.0

In computing this distribution, each respondent was assigned an adoption score for each innovation in terms of his reported stage in the adoption process. One who had fully adopted all innovations would receive a score of one hundred percent, while an individual not aware of any would receive a score of zero percent. With the total scores computed, the sample was distributed into adoption categories by using the method proposed by Rogers.² This was found to approximate a normal curve.³ Since innovators consisted of 0.7 percent

1. Rogers, op.cit., Table 6-4, p. [185].

2. *ibid.* p.162. The standard deviation of the distribution was 20.085 percent and the mean 50.814 percent.

3. The Chi square test was used at the .05 level of significance.

these were combined with early adopters in the subsequent analysis, thus giving four instead of five categories. In certain phases of the analysis a further consolidation of categories was used in which the earlier could be compared with the later adopters. In so doing, innovators, early adopters, and early majority were combined, while late majority and laggards constituted the other group.¹

1. This is consistent with the differentiation made by Rogers, op. cit., Table 6-1, pp. [150-151].

CHAPTER TWO

SOCIO-ECONOMIC CHARACTERISTICS

Certain socio-economic characteristics appear to be associated with the acceptance or rejection of an innovation.¹ These data were collected about each respondent in the sample and have been grouped into four major descriptive categories: individual characteristics such as age, educational level, tenure, and others; community participation; economic characteristics including size of enterprise and financial status; and community perception. The separate items were tested for interrelationships² and they were tested for significant differences between adopter categories using both the four categories and the combination into two categories.³

INDIVIDUAL CHARACTERISTICS

The analysis of the various individual and personal characteristics of the respondents are described in detail below. In most cases, the data were collected in appropriate categories rather than in the form of individual responses, consequently, median values refer to categories rather than to single items.

Age:

The age distribution of the sample was skewed toward the upper age groupings with 10.4 percent less than thirty-five years of age and 36.6 percent over fifty-four years. The median is in the group of 45 to 54 years of age. Age correlated significantly with years in agriculture and years on the present

1. Rogers, op. cit., pp. 172-178. See also: Lionberger, op. cit.

2. Partial correlation coefficients were used for this analysis and these were tested for significance at the .05 level.

3. Chi square values for the distribution were calculated at the .05 level of confidence.

TABLE 3

TABLE OF PARTIAL CORRELATION COEFFICIENTS

NOTE: Underlined coefficients show a high degree of association. The test of association was carried out using the null hypothesis of no correlation and a .05 level of significance. The test is based on the assumption that under the null hypothesis of no correlation the sampling distribution of the correlation coefficient can be approximated closely with a normal curve having the mean 0 and the standard deviation $1/\sqrt{n-1}$ where n is the sample size. Therefore the criterion is to reject the null hypothesis if $r > 1.96/\sqrt{n-1}$ or $r < -1.96/\sqrt{n-1}$ (i.e. if the partial correlation coefficient is less than -.1633 or greater than .1633).

Age	Education	Adult Education	Employment of orcharding	Organizations belonged to	Organizations attended	Organizations contributed to	Committees belonged to	Offices held	Years in agriculture	Years in orcharding	Years on present orchard	Size of enterprise	Acres in orchard	Value of orchard	Relation of ag to non-ag income	Sales of orchard products	Willingness of community to adopt	Community regard of adopters	Community regard of loggards
1.0000	.1132	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Education	.0758	.0690	.2159	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028
Adult Education	.0629	.0576	.2159	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028
Employment of orcharding	.0814	.2479	.0305	.0478	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Organizations belonged to	.0143	.2031	.0938	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028	.0028
Organizations attended	.0531	.0651	.2889	.1516	.0161	.2275	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Organizations contributed to	.0136	.1226	.0618	.0191	.0918	.2022	.0672	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Committees belonged to	.0365	.1398	.0263	.0474	.1258	.0815	.0549	.5183	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Offices held	.3135	.2199	.1084	.0781	.0866	.0677	.0919	.0612	.0750	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Years in agriculture	.0283	.0839	.1084	.0765	.0168	.0444	.0850	.0159	.0897	.4513	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Years in orcharding	.2948	.0876	.0546	.0394	.0478	.0886	.0320	.0877	.0736	.0674	.5624	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Years on present orchard	.0246	.1141	.0073	.1501	.0484	.0093	.0383	.0532	.2034	.0907	.0386	.1362	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Size of enterprise	.1506	.0654	.0416	.0509	.0833	.0539	.0482	.0234	.0142	.0394	.0038	.0974	.3628	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Acres in orchard	.0419	.1086	.0908	.1513	.0282	.0147	.0207	.0234	.0142	.0394	.0038	.0974	.3628	.0410	1.0000	1.0000	1.0000	1.0000	1.0000
Value of orchard	.0527	.2003	.0291	.0596	.0862	.0409	.0642	.1004	.1410	.0098	.2146	.1550	.0402	.0410	.1073	1.0000	1.0000	1.0000	1.0000
Relation of ag to non-ag income	.0786	.0859	.0154	.1083	.0209	.0072	.0752	.0831	.2162	.1059	.0873	.0766	.0547	.0743	.0787	1.0000	1.0000	1.0000	1.0000
Sales of orchard products	.0426	.1148	.0273	.0150	.0153	.0827	.0484	.0097	.0711	.0019	.0124	.0210	.0547	.0743	.0787	.0007	1.0000	1.0000	1.0000
Willingness of community to adopt	.1262	.0045	.0908	.1233	.0641	.0330	.0770	.0853	.1181	.1530	.0181	.0425	.0558	.0552	.1088	.5412	1.0000	1.0000	1.0000
Community regard of adopters	.0860	.0550	.1056	.1171	.0002	.0065	.0276	.0558	.0764	.0359	.1027	.0363	.0600	.0598	.0873	.1205	.0016	1.0000	1.0000
Community regard of loggards																		.2308	1.0000

TABLE FOUR
CHI SQUARE VALUES BETWEEN ADOPTER CATEGORIES

Socio-economic data	Chi square value	
	Using 4 adopter categories	Using 2 adopter categories
Age	6.069	3.754
Education	8.667	2.218
Agriculture course in high school	0.992	0.317
Agriculture courses at university	*	4.035
Adult courses in agriculture	11.996	1.003
Adult courses in other subjects	2.461	0.617
Attendance at district hall chautauqua	13.389	7.213
Attendance at district horticulturist discussion groups	14.662	4.031
Enjoyment of orcharding	10.794	1.896
Subscription to newspapers	2.302	0.835
Subscription to magazines	1.641	0.217
Organizations belonged to	6.607	5.021
Organizations attended	3.775	4.516
Organizations contributed to financially	17.397	5.752
Committees belonged to	5.558	1.674
Offices of organizations held	5.491	2.495
Years in agriculture	6.765	5.863
Years on present orchard	12.646	9.983
Years in orcharding	13.029	8.556
Occupation	19.578	14.658
Size of enterprise	12.527	14.206
Acres on orchard	41.339	27.382
Value of enterprise	17.664	13.161
Tenure	8.127	3.521
Relation of non-ag. income to ag. income	10.841	11.584
Sales value	37.824	49.609
Willingness of community to adopt	3.165	0.301
Community regard of adopters	4.554	2.430
Community regard of laggards	3.752	2.723
Personal reaction to TV Chautauqua	11.665	11.298

NOTE: Underlined values indicate significant differences between adopter categories. A null hypothesis of no difference in proportions between adopter categories was used with a .05 level of significance.

* too many low cell frequencies to carry out a chi square analysis.

orchard only. It was not significantly related to adopter category, therefore, it is neither an asset nor a barrier to the adoption of innovations. These data are not wholly in agreement with the review by Rogers in which he generalizes that "earlier adopters are younger in age than later adopters."¹ He does indicate a lack of unanimity on this point among the research studies he reviewed.

TABLE FIVE
PERCENTAGE DISTRIBUTION OF AGE FOR
ALL RESPONDENTS

Age (years)	N	Percent of respondents
less than 20		0.
20 - 24	1	0.7
25 - 34	14	9.7
35 - 44	35	24.1
45 - 54	39	26.9 (median category)
55 - 64	34	23.4
65 and over	22	15.2
TOTAL	145	100.0

Educational Level

The formal educational level was measured by using years of school completed. The sample population was not well educated since 63.1 percent reported less than junior matriculation²

1. Rogers, op. cit. p. 172.

2. The equivalent term in the United States is high school matriculation.

and the median was the category 9 to 11 years of school completed. University degrees were reported by 4.9 percent and an additional 2.8 percent reported some post graduate study. The correlation coefficients indicate a significant degree of association between educational level and the number of organizations in which an individual held membership but a negative association with organizations attended. The better educated belong to more organizations but attend less.¹ A further negative coefficient was found between education and years in agriculture which indicates that those longest in agriculture had lower educational levels than new entrants in the industry. Educational level also correlated negatively with the relationship of non-agricultural income to agricultural income which suggests that those with more education derived more of their income from non-agricultural sources than did those with a lower educational level.

Educational level was not a significant characteristic in terms of adopter categories; however, particular educational experiences were. Courses at university in agriculture were significant when the two adopter categories were tested but not with four.² Thirteen percent of the earlier adopters attended courses in agriculture at university while only two percent of the later adopters reported such attendance. Courses at high school in agriculture showed no significant relationship to adoption.

In other studies, the relationship between education and adoption is not clear. Lionberger found that the relationship is likely to be indirect, nevertheless, "more than eight years of schooling is almost always associated with higher

1. This tends to be generally consistent with participation research. See: Edmund deS. Brunner, et al., An Overview of Adult Education Research. Chicago: Adult Education Association, 1959. pp. 103ff.

2. Similar findings are reported by: Murray A. Straus and Allen J. Estys, Education for Technological Change Among Wisconsin Farmers. Research Bulletin 214, Ag. Exp. Sta., University of Wisconsin, August 1959.

TABLE SIX
PERCENTAGE DISTRIBUTION OF EDUCATION
FOR ALL RESPONDENTS

Educational Level	N	Percent of respondents
less than 5 years	10	6.9
5 - 8 years	40	27.8
9 - 11 years	42	28.4 (median category)
Junior matriculation	28	19.4
Senior matriculation	14	9.7
University degree	7	4.9
University graduate work	4	2.8
TOTAL	145	100.0

adoption rates than lesser amounts."¹ Rogers analyzes educational level as one dimension of social status and notes studies in which it was significant.² The present study is contrary to some previous research and in agreement with other studies. It appears that elements in the educational experience may hold the clue to the role of educational level in adoption rather than years of school completed alone.

Adult Education

The uncertain relationship between adoption and educational level in the research literature undoubtedly stems from the single dimensional approach to the measurement of education that results from using only the concept of years of school completed. Adult education is an additional measure of educational level that must be taken into account but because of the complex nature of adult education, it is not usually studied specifically

1. Lionberger, op. cit., p. 97.

2. Rogers, op. cit., p. 175.

as a possible variable related to adoption. In many previous research studies adult education activities, such as meetings conducted by agricultural agents, are considered only as one of a number of sources of information. In this capacity meetings often tend to rate low with respect to their relationship to adoption.¹ This procedure has not measured participation in meetings as a specific variable. It is the active participation in a meeting that is important for only then can the effects of the instructional process achieve its potential effect.

The isolation of specific educational activities is not always easy but in this particular situation there were four principal activities in which Okanagan Valley orchardists participated:

1. General Adult Courses. The public school districts in the Okanagan Valley operated adult night classes in a variety of subjects other than agriculture which were available to orchardists. Attendance in such classes was reported by forty percent of the respondents, however, this showed no significant relationship to adoption.

2. Adult Courses in Agriculture. Various agencies occasionally offered courses in agricultural subjects in the Valley. Attendance at such courses was reported by 13.1 percent of the sample. This was found to be significant when using four adopter categories but not with two. Forty-two percent of the innovators and early adopters reported attendance at adult courses in agriculture while only seven percent of the early majority and a like percentage of the late majority indicated such attendance. Thirteen percent of the laggards indicated participation in this type of adult education. (TABLE SEVEN)

1. M.C. Wilson and Gladys Gallup, Extension Teaching Methods and Other Factors That Influence Adoption of Agricultural and Home Economics Practices. Federal Extension Service Circular 495. Washington: U.S.D.A., August 1955.

TABLE SEVEN

PERCENTAGE DISTRIBUTION OF ATTENDANCE AT ADULT
COURSES IN AGRICULTURE BY ADOPTER CATEGORY

Adopter Category	Attendance at adult courses in agriculture		Total
	Yes	No	
	%	%	%
Innovators and early adopters	42.0	58.0	100.0
Early majority	7.4	92.6	100.0
Late majority	7.1	92.9	100.0
Laggards	13.0	87.0	100.0
All respondents	13.0	86.9	100.0

3. District Hall Chautauqua. The annual District Hall Chautauqua was one of the principal group methods of education used by the Provincial Department of Agriculture to inform orchardists about new practices. There were generally well

TABLE EIGHT

PERCENTAGE DISTRIBUTION OF ATTENDANCE AT DISTRICT
HALL CHAUTAUQUA BY ADOPTER CATEGORY

Adopter Category	Attendance at District Hall Chautauqua					Total
	N	Yes	N	No	N	
		%		%		%
Innovators and early adopters	17	85.0	3	15.0	20	100.0
Early majority	44	74.6	15	25.4	59	100.0
Late majority	26	56.5	17	43.5	43	100.0
Laggards	5	25.0	18	75.0	23	100.0
All respondents	92	63.4	53	36.6	145	100.0

attended and 63.4 percent of the sample indicated such attendance. This was significantly related to adoption when using both the two and the four adopter categories. Eighty-five percent of those quickest to adopt the practices studied reported attendance but only twenty-five percent of the laggards did so.

4. District Horticulturist Discussion Groups. Regular discussion groups were conducted in local areas to assist orchardists in resolving their problems. Attendance at these sessions was reported by 64.1 percent of the sample. Ninety percent of the innovators and early adopters attended these group meetings but only twenty-two percent of the laggards. Such attendance was significantly related to adoption scores when using both the two and the four adopter categories.

TABLE NINE

PERCENTAGE DISTRIBUTION OF ATTENDANCE AT DISTRICT
HORTICULTURIST DISCUSSION GROUPS BY ADOPTER CATEGORY

Adopter Category	Attendance at District Horticulturist Discussion Groups					Total
	N	Yes	N	No	N	
		%		%		%
Innovators and early adopters	18	90.0	2	10.0	20	100.0
Early majority	44	74.6	15	25.4	59	100.0
Late majority	26	60.5	17	39.5	43	100.0
Laggards	5	21.7	18	78.3	23	100.0
All respondents	93	64.1	52	35.9	145	100.0

When the various measures of education were correlated with percentage of adoption in various combinations as shown

on TABLE TEN, the importance of adult education is obvious. With this particular population, the important educational variable appears to be participation in adult education designed specifically for that population. Furthermore, this illustrates the multi-dimensional character of education as a variable.

TABLE TEN

PARTIAL CORRELATION COEFFICIENTS BETWEEN SELECTED COMBINATIONS OF EDUCATION AND THE ADOPTION OF INNOVATIONS

Years of School Completed	.1135
Adult Education	<u>.3735</u>
Adult Education and Years of School Completed	<u>.3735</u>
All Education	<u>.3724</u>

The underlined coefficients show a high degree of association. The test of association was carried out using the null hypothesis of no correlation and an .05 level of significance.

In this study the usual measure of educational level as years of school completed is not related to adoption which is generally consistent with other research. When particular facets of educational level are isolated a significant relationship begins to appear. Thus, agricultural courses in high school, at university, and in adult education show a higher correlation than educational level alone, or educational level plus agricultural courses in high school and university. The adult educational activities alone and in various combinations produce higher correlation coefficients than all education and the highest correlation coefficient is obtained by those adult education activities that are specifically for this particular population. This suggests that the amount of education is not as significant a factor as the

recency of the educational experience and its specific relevancy with respect to the content.¹

Enjoyment of Orchardring

An individual's enjoyment of his occupation should affect his relationship to it by making him more or less susceptible to innovations according to his involvement with his work. The orchardists were asked about their enjoyment of orcharding with responses recorded on a three point scale. The responses indicated that 79.3 percent enjoyed their work "very much" and only 1.4 percent reported "not at all." This correlated significantly only with adult education and it was related to adoption when four adopter categories were considered. The percentage of respondents favorably disposed toward orcharding was highest among innovators and early adopters at 95.0 percent but decreases through the adopter categories to 56.5 percent among the laggards. It would appear, therefore, that satisfaction from the occupation does influence adoption but obviously a more precise measure of satisfaction is necessary for any clear cut relationship to be established.

Years in Agriculture

Most of the respondents had been in agriculture a long time. Twenty or more years in agriculture were reported by 68.3 percent while only 7.6 percent reported less than ten years. As noted previously, years in agriculture correlates negatively with education and positively with age and years in orcharding. It is not related to adoption.

Twenty or more years in orcharding was reported by 46.2 percent and less than ten years by 22.8 percent of the sample. This correlates significantly with years in agriculture as indicated, with years on the present orchard, and with the relationship between agricultural and non-agricultural income. It is related to adoption with both two and four adopter cate-

1. This is in agreement with the work of Straus and Estys, op. cit.

gories - the general trend being for the higher adopters to have been longest in orcharding. The highest percentage in the group twenty years and over was in the category early adopters followed by innovators and early majority. At the other end of the continuum, the largest percentage five years or less was in the category laggards with innovators next and finally early adopters. (TABLE ELEVEN)

TABLE ELEVEN
PERCENTAGE DISTRIBUTION OF YEARS IN ORCHARDING
BY ADOPTER CATEGORY

Adopter category	Years as an orchardist				Total
	Less than	20 or			
	5	5 .. 9	10 - 19	over	
	%	%	%	%	%
Innovators and early adopters	10.0	15.0	30.0	45.0	100.0
Early majority	5.1	13.6	20.3	61.0	100.0
Late majority	9.3	16.3	34.9	39.5	100.0
Laggards	13.0	13.0	52.2	21.7	100.0
All respondents	8.3	14.5	31.0	46.2	100.0

Years on the present orchard showed 24.8 percent with twenty or more years and 21.3 percent having less than ten years. This correlated with age and number of years in orcharding. It is significantly related to adoption when using two adopter categories. Again the trend was for the earlier adopters to have been on their orchard longer. (TABLE TWELVE)

TABLE TWELVE
PERCENTAGE DISTRIBUTION OF YEARS ON PRESENT ORCHARD

Adopter category	Years on present orchard					Total
	Less than				20 or	
	1	2 - 4	5 - 9	10-19	over	
	%	%	%	%	%	%
Innovators, early adopters and early majority	1.2	15.2	17.7	32.9	32.9	100.0
Late majority and laggards	7.6	19.7	13.6	43.9	15.1	100.0
All respondents	4.1	17.2	15.9	37.9	24.8	100.0

Miscellaneous

Three additional characteristics were studied but these showed no relationship to adoption. These included subscriptions to newspapers and magazines, and the possession of a television set in working order. Subscriptions to at least one local newspaper were reported by 90.0 percent and to at least one farm magazine by 84.6 percent. Television sets were reported by 92.4 percent of the sample.

ECONOMIC CHARACTERISTICS

The indices of economic status used in this study included occupation, total size of enterprise, acres in orchard, value, ownership, sales value, and the relation between agricultural and non-agricultural income. For convenience these data are discussed in two sections: size and financial status.

Size of Operation

The agricultural operations in the fruit growing sections of the Okanagan Valley are generally small. The median size of the total agricultural enterprise was in the category of

cen to nineteen acres. There were 31.7 percent of the sample who operated less than ten acres and 6.9 percent less than three. Conversely, 36.4 percent operated more than twenty acres with 1.8 percent reporting more than 180 acres. There was no difference by adopter category with respect to the median size of the total enterprise, however, size correlated significantly with the number of offices held with acres in orchards, and with the total value. Size was not related to adoption but there was a general trend towards the earlier adopters being those with the larger operations.

TABLE THIRTEEN
PERCENTAGE DISTRIBUTION OF ACRES IN
ORCHARD BY ADOPTER CATEGORY

Adopter Category	Acres in orchard								Total
	less than	3 - 9	10-19	20-39	40-54	55-69	70-179	180 +	
	3 %	3 %	10-19 %	20-39 %	40-54 %	55-69 %	70-179 %	180 %	
Innovators and early adopters	5.0	10.0	<u>60.0</u>	25.0	0.0	0.0	0.0	0.0	100.0
Early majority	0.0	28.8	<u>28.8</u>	33.9	5.1	1.7	0.0	1.7	100.0
Late majority	9.3	<u>41.9</u>	41.9	4.7	2.3	0.0	0.0	0.0	100.0
Laggards	<u>26.1</u>	56.5	4.4	13.0	0.0	0.0	0.0	0.0	100.0
All respon- dents	7.6	34.5	<u>33.1</u>	20.7	2.8	0.7	0.0	0.7	100.0

The number of acres in orchard closely follows the distribution for the total enterprise with the median falling in the same 10 to 19 acre category. Less than ten acres in orchard was reported by 42.1 percent and 7.6 percent of those had less than three acres. At the other extreme, 24.9 percent had more than twenty acres with 0.7 percent larger than 180. The

median size of orchard varied among the adopter categories. Laggards had a median of three acres or less, the late majority a median of 3 to 9 and innovators, early adopters, and early majority were in the 10 to 19 acre category. The number of acres in orchard correlated with the size of the total enterprise and with the sales value of orchard products which is not unexpected. Furthermore, the number of acres in orchard was significantly related to adoption when using either two or four categories. Generally, the larger orchards are in the early majority and the smaller are found among the laggards.

These operations were wholly owned by 89.7 percent of the sample with 2.1 percent renting and 7.6 percent owning part and renting part. All of the laggards completely own their orchards while the largest number of part owners and part renters are found among the innovators and early adopters. This factor of ownership is significantly related to adoption when using the four adopter categories.

Financial Status

The majority of the respondents were full-time orchardists and this was related to adoption with both the two and four adopter categories. Ninety percent of the innovators and early adopters were full-time orchardists as compared with thirty percent of the laggards. The early majority were 70 percent full time and the late majority 51 percent. An inverse relationship between adoption and employment in certain occupations is evident. There were no innovators and early adopters employed in other types of agriculture or in managerial, clerical and sales, logging, fishing, mining, and related occupations while laggards constituted the largest percentage in these occupations. The technical and professional occupations show a direct relationship with adoption with ten percent of the innovators and early adopters in these occupations but none of the laggards.

Over half of the sample reported no income from sources other than orcharding. One-fourth of them had income from

TABLE FOURTEEN
PERCENTAGE DISTRIBUTION OF THE RELATIONSHIPS OF
AGRICULTURE AND NON-AGRICULTURE INCOME BY ADOPTER CATEGORY

Adopter Category	Relation of other income to ag. income						Total.
	No income other sources	Half as much less	Less or than but grtr. than half as much	Equal to	Grtr. but less than twice as much	Twice as much or grtr.	
	%	%	%	%	%	%	%
Innovators, early adopters and majority	60.7	15.2	1.3	5.6	3.8	13.9	100.0
Late majority and laggards	46.1	1.6	4.6	9.2	4.6	33.8	100.0
All respondents	54.1	9.0	2.8	6.9	4.2	23.0	100.0

non-agricultural sources that was either twice as much or greater than their agricultural income. The relationship between agricultural and non-agricultural income had a negative correlation with education and a positive correlation with years in orcharding and the sales of orchard products. Earlier adopters tended to have less income from sources other than agriculture than later adopters. Source of income was significant with two adopter categories. (TABLE FIFTEEN)

The median value of orchard products sold in 1962 was in the range from \$3,750 to \$4,999. Less than \$2,500 in sales was reported by 31.3 percent and 18.1 percent received less than \$1,200. On the other hand, 45.0 percent reported more than \$5,000 in sales with 15.2 percent of these over \$10,000 and 1.4 percent in excess of \$25,000 in sales. The sales value of orchard products was significantly related to adoption. Among the laggards, 47.8 percent reported less than \$1,200 in sales while the majority of the innovators and early adopters reported \$5,000 to \$9,999 in sales. The value of sales correlated significantly with offices held, acres in orchard, total value

TABLE FIFTEEN

PERCENTAGE DISTRIBUTION OF VALUE OF ORCHARD
PRODUCTS SOLD BY ADOPTER CATEGORY

Value of orchard products sold in 1962:									
Adopter Category	less than \$1200	\$1200 to \$2499	\$2500 to \$3749	\$3750 to \$4999	\$5000 to \$9999	\$10000 to \$14999	\$15000 to \$24999	\$25000 +	Total
	%	%	%	%	%	%	%		
Innovators and early adopters	5.0	0.	0.	15.0	<u>55.0</u>	15.0	10.0	0.	100.0
Early Majority	6.8	10.2	11.9	13.6	<u>32.2</u>	10.2	11.9	3.4	100.0
Late Majority	23.8	<u>23.8</u>	16.7	2.4	28.6	0.	4.8	0.	100.0
Laggards	47.8	<u>13.0</u>	26.1	8.7	4.4	0.	0.	0.	100.0
All Respondents	18.1	13.2	13.9	<u>9.7</u>	29.8	6.2	7.6	1.4	100.0

NOTE: The median categories are underlined.

of enterprise, and to the relationship between non-agricultural and agricultural income.

The median gross value of the establishments was from \$14,950 to \$24,949 with twenty percent reporting a value in excess of \$49,950. Gross value correlated significantly with size as would be expected and it was related to adoption. The more valuable operations were in the hands of innovators and early adopters while the less valuable were operated by laggards.

These measures of financial status are consistent with previous research. Rogers generalizes from research studies that: "Earlier adopters have a more favourable financial position than later adopters."¹ In the Okanagan Valley, those orchardists

1. Rogers, *op. cit.*, p. 175.

TABLE SIXTEEN
PERCENTAGE DISTRIBUTION OF ENTERPRISE
VALUE BY ADOPTER CATEGORY

Adopter Category	Value of enterprise in dollars:						Total
	under 4950	4950- 9949	9950- 14949	14950- 24949	24950- 49949	49950- or over	
	%	%	%	%	%	%	%
Innovators and early adopters	5.0	0.0	0.0	15.0	<u>40.0</u>	40.0	100.0
Early majority	0.0	1.8	8.8	35.1	<u>31.6</u>	22.8	100.0
Late majority	0.0	2.3	16.3	<u>46.5</u>	23.3	11.6	100.0
Laggards	0.0	8.7	17.4	<u>43.5</u>	21.7	8.7	100.0
All respondents	0.7	2.8	11.2	<u>38.0</u>	27.6	19.6	100.0

NOTE: The median categories are underlined.

with many years experience and higher sales receive most of their income from agriculture. They tend to be older, have larger operations, greater investment in their business and were elected to offices in community organizations. They tend to be the earlier adopters and they are more apt to view unfavorably those who are slow to adopt innovations.

COMMUNITY PARTICIPATION

Active participation in the organized life of the community is generally low. Membership in no organizations was reported by 45.5 percent of the sample with 35.3 percent

indicating membership in two or more local organizations.¹ The maximum number of memberships held was in eight organizations but this was reported by 0.7 percent of the respondents. The median number of organizational memberships held was one. The number of local organizations attended at least once a year differs slightly from memberships with 44.8 percent reporting no attendance, 35.9 percent reporting attendance at two or more, and 0.7 percent attending a maximum of seven.

Although they belong to few local organizations and attend rarely, the orchardists do contribute financially to some organizations. No contributions were reported by 39.3 percent and 44.8 percent contributed to two or more with 0.7 percent contributing to a maximum of twenty local organizations.

There was a positive correlation between organizational membership and education but a negative correlation between attendance and education. Furthermore, 'organizations attended' correlates significantly with organizational membership and contributions with attendance. None of these relationships are unexpected, except, possibly, the negative correlation between education and attendance.

The acceptance of leadership responsibility is not characteristic of the orchardists studied. No committee memberships were reported by 70.3 percent, while 13.8 percent report membership on one committee and 15.8 percent two or more with 0.7 percent reporting a maximum of five committee positions. Similarly no offices in local organizations were held by 74.5 percent, while 14.5 percent reported one and 10.4 percent reported two or more with 0.7 percent holding a maximum of four offices. Significant correlations were found between offices held and organizational memberships and between offices and committee memberships. Offices held correlated with the size of the

1. Membership in a church or in the B.C. Fruit Growers Association was excluded as most orchardists could be presumed to belong to these two.

orchard and with the value of orchard products sold. None of these measures of community participation was significantly associated with adoption.

COMMUNITY PERCEPTION

The interview schedule included questions designed to measure community attitudes about the acceptance or rejection of innovations as perceived by the respondents. Favorable responses were indicated by the 65.3 percent, while 29.2 percent considered their community was about average and 5.6 percent reported that it was not very willing to accept new ideas. Adopters were regarded favorably by the community according to 72.5 percent of the respondents, while 27.5 percent thought the community indifferent and 4.9 percent felt it regarded adopters unfavorably. Laggards, on the other hand, were favorably regarded by 4.3 percent, not favorably by 32.6 percent, and indifferently by 63.1 percent. A significant correlation was obtained between community regard of adopters and the willingness of the community to adopt. The community regard of laggards was positively related to sale of orchard products and to community regard of adopters both of which are low as indicated. Thus, the community tends to support those who adopt new practices but is unconcerned about those who do not.

ADOPTION AND SELECTED VARIABLES

A partial correlation coefficient between selected variables and percentage of adoption produced three independent variables with a high degree of association. These variables were participation in adult education, organizations contributed to financially, and sales value of orchard products.

TABLE SEVENTEEN

PARTIAL CORRELATION COEFFICIENTS BETWEEN
SELECTED VARIABLES AND ADOPTION PERCENTAGES

Variable Name	Partial Correlation Coefficient
Age	-.0358
Education	.1135
Adult Education	<u>.3535</u>
Enjoyment of orcharding	<u>.0784</u>
Organizations belonged to	-.0076
Organizations attended	.0229
Organizations contributed to financially	<u>.2029</u>
Committees belonged to	-.0670
Offices of organizations held	-.0225
Years in Agriculture	.0371
Years in orcharding	.0296
Years on present orchard	-.0064
Size of enterprise	-.1264
Acres in orchard	-.0594
Value of enterprise	.1091
Relation of non-ag. income to ag. income	.1274
Sales value of orchard products	<u>.1726</u>
Willingness of community to adopt	<u>.0640</u>
Community regard of adopters	.0976
Community regard of laggards	-.0949

NOTE: Underlined values indicate a significant degree of association. For the tests of significance a null hypothesis of no correlation was used with a .05 level of significance.

A multiple regression of several variables included participation in adult education, organizations contributed to financially, size of orchard, relationship of agricultural to non-agricultural income, and the sales value of orchard products. A significant coefficient of determination was obtained of .3490 indicating that 34.9 percent of the variation in adoption percentage may be explained by the variation in these five variables.

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CHAPTER THREE

THE DIFFUSION OF INFORMATION

Fruit growers in the Okanagan Valley have access to new information from a variety of sources and through a wide selection of media. The most consistent and systematic diffusion of information has been accomplished by commercial enterprises doing business in equipment and supplies for orchards; by the orchardist's own cooperative marketing organization; and by the Federal Research Station at Summerland; and by the District Horticulturists from the Provincial Department of Agriculture. Of these principal sources of information, the District Horticulturists have provided the most systematic programs about new and improved practices for the continuing education of orchardists.

At the time of this study, the Provincial Department of Agriculture maintained a staff of twelve field men in the Okanagan Valley including nine District Horticulturists, an apiarist, a plant pathologist, and an entomologist. The Extension Branch had a staff of two District Agriculturists in the area. The primary contact with the orchardist was through the District Horticulturist who provided personalized services, conducted meetings and generally planned and managed various instructional or diffusion programs. These men have a long tradition, established early in the history of orcharding in the Okanagan Valley, of providing individual instruction and personal services to individuals through office and farm visits. For some growers they are, and have been, the principal source of new ideas which may reduce somewhat the apparent bias introduced by using them as the field staff for interviews in this study.

Organized group instruction has been provided through two main activities conducted by the District Horticulturist. For some fifty years the Department of Agriculture has conducted an

annual "District Hall Chautauqua."¹ This activity consisted of a number of specialists from the Department of Agriculture, the Research Station, the University, industry, or any other appropriate source, who spent several weeks travelling from one community to another to present information. In recent years these groups have given thirty or more presentations in various centers throughout the Okanagan Valley. In the last few years this activity has been replaced by a TV Chautauqua.² The other main activity of the District staff has been the conduct of local neighborhood discussion groups in which innovations were discussed along with other problems and issues. The extent of participation in these two activities has been indicated earlier.³

The Summerland Research Station was established in 1914 and has made a number of significant contributions to the fruit industry through its research activities. Personnel from the Station have long been active in educational programs for orchardists and they have welcomed visits from those in search of information or assistance. The growers' association has been active on matters related to marketing in particular and has participated in educational programs. In addition, there have been numerous other informative media and sources available to orchardists in varying degrees. The sum total of all these forces has been analyzed in this study as the informational process.

INFORMATIONAL PROCESSES

Each stage in the adoption process involves information to some degree and the successful achievement of the adoption of an innovation depends upon the availability of adequate informa-

1. The name Chautauqua applied to this activity derives from the travelling tent Chautauquas which were popular in the beginning of this century. See: Harry P. Harrison, Culture Under Canvas. N.Y.: Hastings House, 1958.

2. See Chapter Five.

3. See TABLES EIGHT and NINE.

tion in usable form. Rogers has determined two basic categories of information in his analysis of adoption research: impersonal versus personal and cosmopolite versus localite.¹ He notes that impersonal and cosmopolite information sources are more important for the relatively early adopters than for the later adopters. In an attempt to analyze information sources, the present study classified the various sources into three different dimensions. These include origin or source type, the method or way in which the information is made available to the farmer, and the nature of the contact established between the information and the farmer. Each dimension was then subdivided into appropriate categories. The placement of each individual information median into a dimension and category is indicated in Table Eighteen.

Source Type

The dimension source type identifies the place of origin of the information. This is somewhat analogous to Rogers' category of cosmopolite versus localite, however, it is subdivided into four categories as follows:

1. Mass Media: Information generally available to the population or to a generalized segment of it as distinct from discrete or specifically defined groups in the population. The information may originate with any agency.

2. Agricultural Agencies: Information originating with organizations primarily concerned with agriculture and made primarily to those in agriculture.

3. Commercial: Information originating with those organizations with which agriculturists have business transactions.

4. Informal: Information not associated directly with any organization or agency and available to individuals from individuals on a personal basis.

1. Rogers, op. cit., p. 179ff.

TABLE EIGHTEEN
CLASSIFICATION OF SOURCES OF INFORMATION

Source of Information	Classification by:		
	Type	Method	Contact
Magazines	M	M	I
Newspapers	M	M	I
Radio	M	M	I
Television	M	M	I
B.C. Dept. of Agriculture Publications	M	M	I
Federal Dept. of Agriculture Pub.	M	M	I
T.V. Chautauqua	M	M	I
District Hall Chautauqua	A	G	I
District Horticulturist Discussion groups	A	G	P
Agric. Meeting and Adult Educ. Courses	A	G	I
Vocational Agriculture Courses	A	G	P
University Courses in Agriculture	A	G	P
Field Days	A	G	I
Summerland Research Station	A	I	P
Cooperatives	C	I	P
U.B.C.	A	I	P
B.C. Tree Fruits Limited	C	I	P
B.C. Fruit Growers' Association	A	I	P
Packing Houses	C	I	P
Foreign Travel	I	I	P
Salesmen or Dealers	C	I	P
District Horticulturist	A	I	P
Employees	I	I	P
Vocational Agriculture Teacher	A	I	P
Neighbours	In	I	P
Other Orchardists	In	I	P
Relatives	In	I	P

<u>KEY</u>			
M:	mass media	M: mass	P: personal
A:	agricultural agencies	G: group	I: impersonal
C:	commercial	In.: individual	
In.:	informal		

Method

This dimension of the informational process identifies the ways in which new information is brought to the attention of the farmer. On the one hand, there are those methods which disseminate information generally but from which learning occurs largely by chance since there is no specific direction of the learning process. On the other hand, certain methods aim to accomplish learning systematically through instruction.¹ Previous research has not differentiated clearly between these two specific aspects of diffusion. Wilson and Gallup tended to do so in their analysis of information sources but they lacked a theoretical structure.² The sub-categories of this dimension are as follows:

1. Mass: Those informational methods which contact large numbers of individuals at one time and which disseminate information generally.
2. Group: Those informational methods which are educational in nature and provide opportunities for systematic learning through instructional groups.
3. Individual: Those informational methods which enable individual farmers to acquire information systematically on a personal basis. This includes personal influence through contacts of farmers with each other, or with the District Horticulturist.

Contact

The relationship established between the information and the farmer by the informational process may be direct or abstract. A direct relationship is apt to be personal and instructional while an abstract relationship will be impersonal and informational.

1. The conceptual differentiation upon which this classification is based is found in: Coolie Verner, A Conceptual Scheme for the Identification and Classification of Processes for Adult Education. Washington: Adult Education Association, 1962.

2. Wilson and Gallup, op. cit.

Impersonal: Informational processes which do not involve extensive face to face contact with the farmer.

Personal: Informational processes which tend to involve direct contact with the farmer and allow for an interaction among the individuals involved.

This dimension is analogous with Rogers' category. In these three dimensions, therefore, that of method is an attempt to make a precise differentiation between those sources of information which are instructional in nature and those that accomplish the general diffusion of information. The three dimensions are different ways of looking at information and are not directly comparable as each category analyzes information from a different point of view and the dimensions are not mutually exclusive with respect to the individual items providing information.

DIFFUSION BY STAGES IN THE ADOPTION PROCESS

The three dimensions of the informational process were analyzed by stages in the adoption process and by each adopter category. Significant differences are noted between the stages and the categories when the dimensions of type and method are considered. By contact, however, only the laggards do not show a significant difference between adoption stages. The District Horticulturists were reported more often as the principal source of information at all stages in the adoption process.¹ Their influence ranged from 19 percent at the awareness stage to 31 percent at the trial stage. The five most used sources of information are indicated on Table Nineteen for each stage in the adoption process.

1. Since the District Horticulturists conducted the interviews, there is a definite possibility of bias at this point but in view of their long tradition of individualized service to orchardists, these data may be an accurate reflection of their role as a source of information.

TABLE NINETEEN

THE FIVE MOST FREQUENTLY USED SOURCES OF INFORMATION BY STAGE IN THE ADOPTION PROCESS

Awareness Source	ADOPTION			STAGE		
	% Use	Interest Source	Evaluation Source	% Use	Trial Source	% Use
District horticult.	19.02	District horticult.	District horticult.	29.10	District horticult.	31.06
Magazines	13.63	Other orchardists	Other orchardists	20.15	Other orchardists	20.83
Summerland research sta.	9.25	Summerland research sta.	Summerland research sta.	13.06	Summerland research sta.	11.74
T.V. Chau-tanqua	9.51	Neighbours	Salesmen & dealers	4.85	Neighbours	6.44
T.V.	7.97	Co-operatives	B.C. Dept. of Agric. Pub.	4.48	Co-operatives	5.30
					Summerland research sta. } Relatives* }	5.53
TOTAL	59.38	69.50	71.64	75.37		72.81

* Tie

Source Type

The use of information sources classified by the dimension source type is illustrated on Figure One. This shows a decline in the use of mass media between the awareness and interest stages with a slight increase for most adopter categories at the trial stage. Agricultural agencies generally increase in importance between the awareness and interest stages but show a tendency to decline during adoption. Little variation over the stages is shown by commercial sources, however, these are slightly less important at the awareness stage than otherwise. Informal sources increase in importance to the evaluation stage, decrease between the evaluation and trial stages, and then increase again for adoption. (TABLE TWENTY)

Method

There are significant differences in the use of information sources when the dimension of method is analyzed by stages and categories. These data are shown on Figure Three. The mass methods are used more at the awareness stage and decline in subsequent stages. The differences are significant in every case. Group methods show a significant increase in use only between the trial and adoption stages. Individual methods at all subsequent stages are used more than at the awareness stage.

At the awareness stage, both mass and individual methods show significant differences over group methods. At the interest, evaluation, trial and adoption stages, individual methods were reported as being used to a significantly greater extent than mass or group methods. At the trial stage mass methods are also significantly better than group methods even though they are less than individual methods. At no stage are group methods significantly better than mass or individual methods. (TABLE TWENTY)

TABLE TWENTY

SOURCE USE BY STAGES IN THE ADOPTION PROCESS FOR ALL RESPONDENTS

CLASSIFICATION OF										SOURCES BY:	
T Y P E					M E T H O D					C O N T A C T	
Mass Media	Agric. Agen's	Commer- cial	Infor- mal	Total	Mass	Group	Indi- vidual	Total	Personal	Imper- sonal	Total
%	%	%	%	%	%	%	%	%	%	%	%
Awareness 44.3	37.3	6.1	12.3	100.0	44.5	6.4	49.1	100.0	51.7	48.3	100.0
Interest 14.8	50.3	10.7	24.2	100.0	14.6	10.0	75.4	100.0	78.0	22.0	100.0
Evaluation 10.8	48.9	9.7	30.6	100.0	9.7	5.4	84.9	100.0	84.3	15.7	100.0
Trial 14.0	47.4	10.2	28.4	100.0	14.0	3.4	82.6	100.0	83.0	17.1	100.0
Adoption 10.6	42.4	8.3	38.7	100.0	10.6	12.4	77.0	100.0	82.5	17.5	100.0
Average 21.2	44.9	8.9	25.1	100.0	20.8	7.3	71.9	100.0	73.7	26.4	100.0

FIGURE ONE

Percentage use of information source types by stages in the adoption process

KEY

All Respondents
Innovators and Early Adopters
Early Majority
Late Majority
Laggards

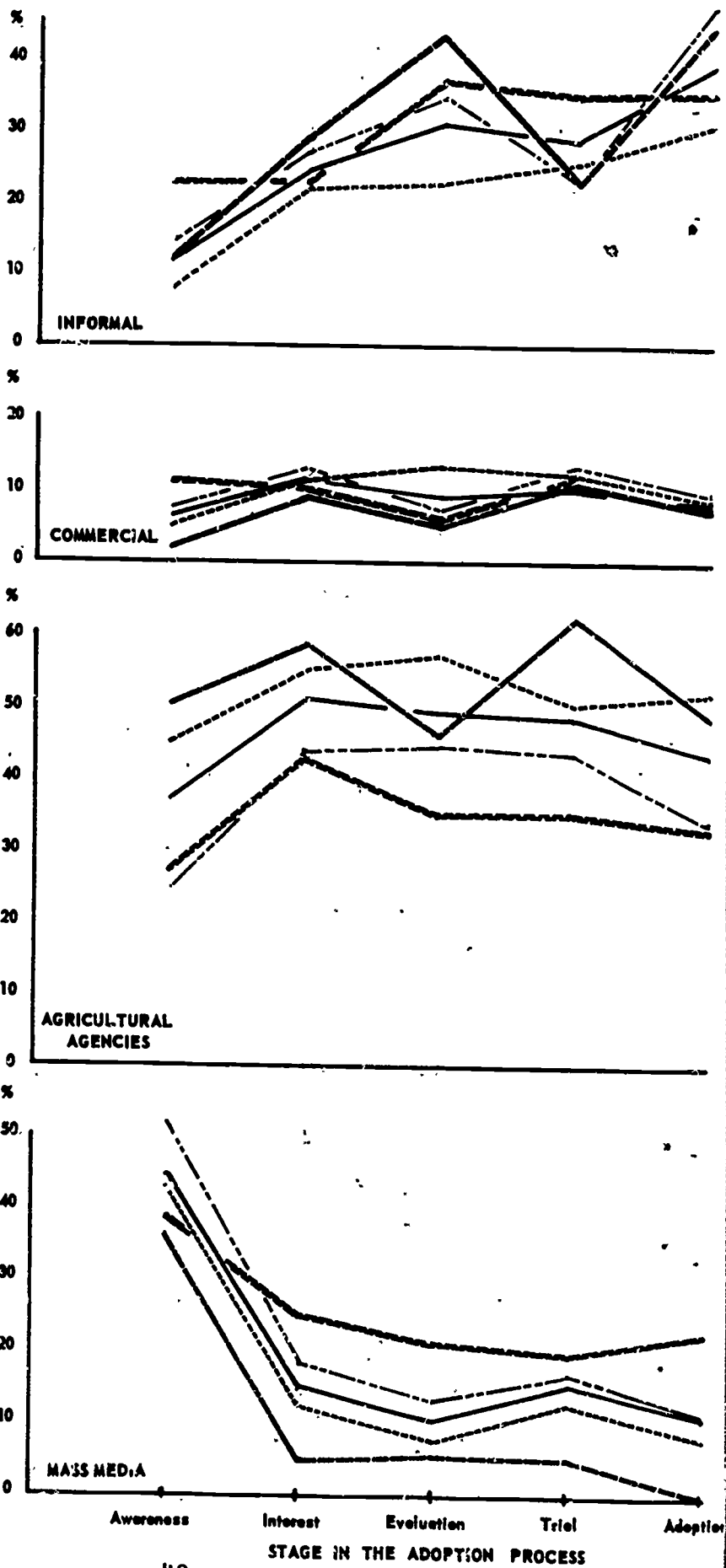


FIGURE 2
Percentage use of information
source methods by stage in the
adoption process

KEY
All Respondents
Innovators and
Early Adopters
Early Majority
Late Majority
Laggards

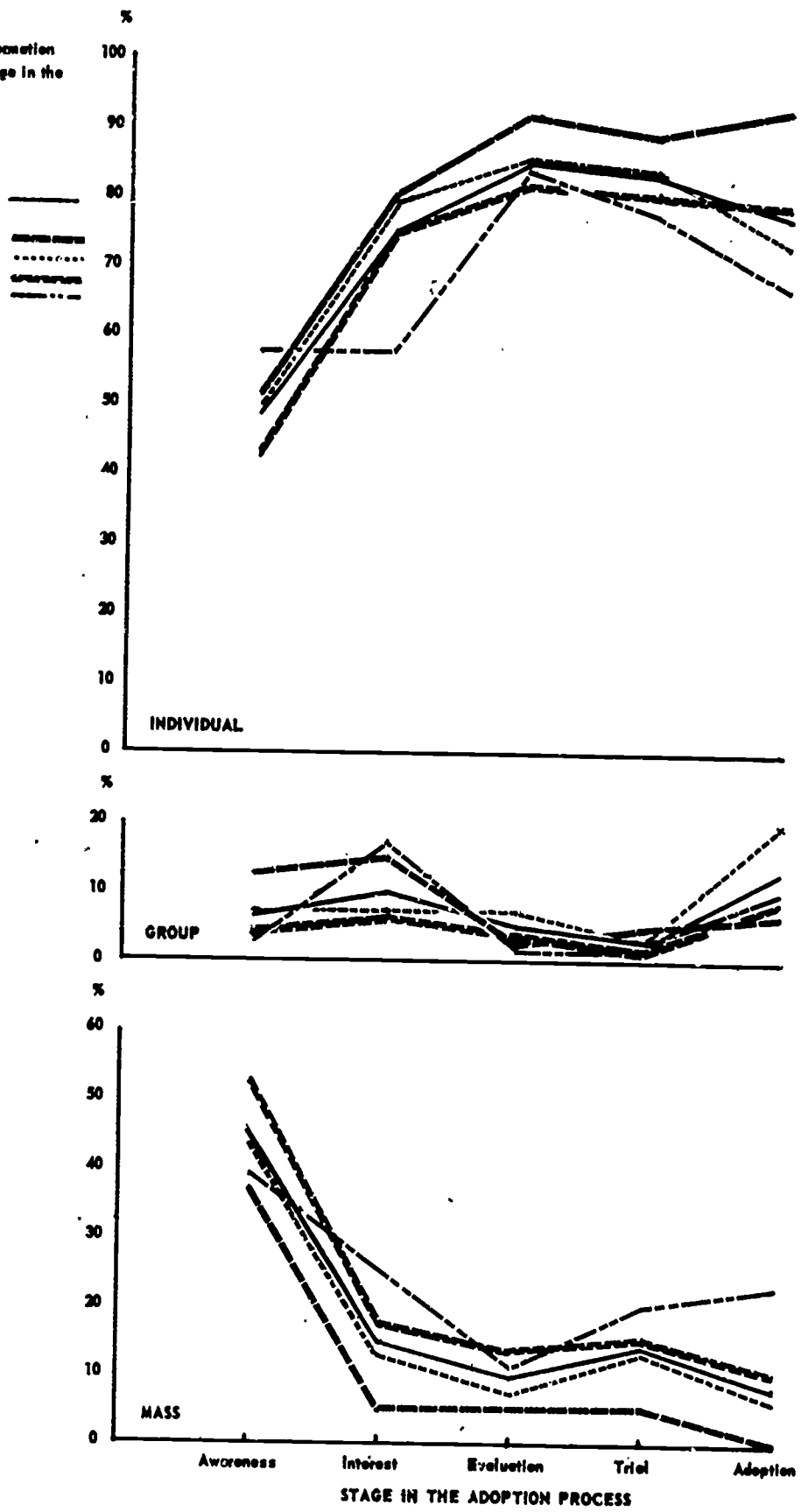
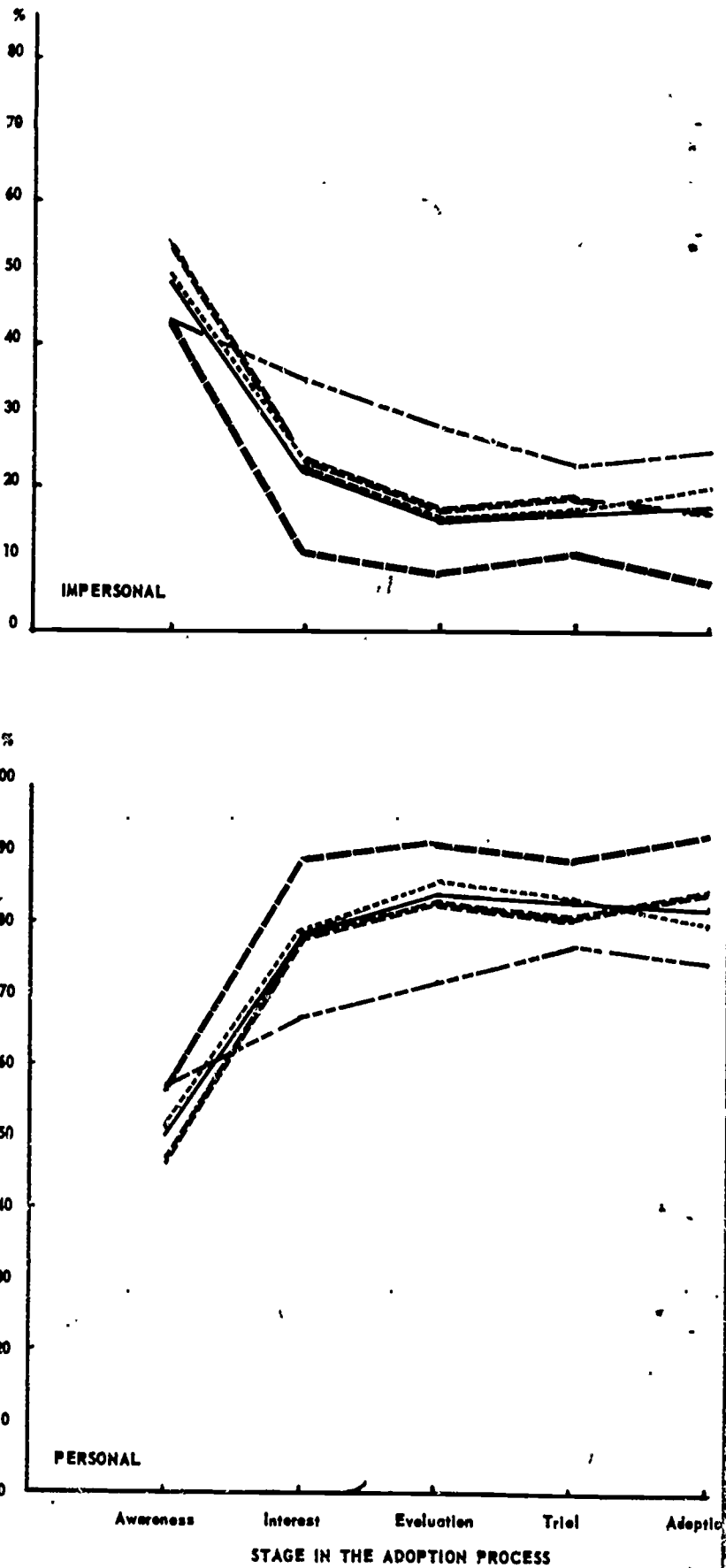


FIGURE 3
Percentage use by degree of
contact of information sources
by stages in the adoption
process

KEY

All Respondents
Innovators and
Early Adopters
Early Majority
Late Majority
Laggards



Contact

The analysis of the use of information media classified by contact is illustrated on Figure Three. An increasing use of personal contacts up to the evaluation stage is evident. Between evaluation and adoption a slight decrease occurs. Impersonal contact declines sharply between awareness and evaluation with a slight increase at the trial stage and a decline again to adoption. Personal contacts show a significant difference in use in subsequent stages over that at the awareness stage while impersonal contact is greatest at the interest stage. There is no significant difference between personal and impersonal contact at the awareness stage only. (TABLE TWENTY)

DIFFUSION BY ADOPTER CATEGORY

Comparisons were made of the use of information media between adopter categories for all stages in the adoption process. At all stages there were significant differences in use for each dimension. At the awareness stage there were significant differences among adopter categories when the media were classified by source type and method but not by contact. At the interest stage in method only, and at the evaluation stage in source type only. The trial and adoption stages showed no significant differences in use by adopter categories.

By adopter category, the five most popular information media again shows the District Horticulturist ranked first by all but the laggards who ranked second. When comparing the ranking by adoption category with the ranking by stages in the adoption process, the same items appear on both lists, however, the list by stages includes cooperatives, salesmen and dealers, and field days which do not appear among the top ranks on the list by adopter category. These rankings by adopter category are shown on TABLE TWENTY-ONE.

TABLE TWENTY-ONE
THE FIVE MOST POPULAR SOURCES OF INFORMATION
BY ADOPTER CATEGORY

ADOPTER CATEGORY					
Innovators and early adopters	Early majority	Late majority	Laggards		
Source % Use	Source % Use	Source % Use	Source % Use	Source % Use	Source % Use
District horticul. 15.9	District horticult. 23.4	District horticult. 18.2	Other orchar- dists 18.1		
Summerland research station 15.6	Summerland research station 13.2	Other orchar- dists 17.7	District horticult. 17.8		
Other orchar- dists 12.6	Other orchar- dists 12.3	Magazines 10.1	Neigh- bours 8.1		
Magazines 11.1	TV Chau- tauqua 7.9	TV Chau- tauqua 7.7	TV 7.1		
TV Chau- tauqua 9.9	Magazines 7.1	B.C.Dept. of Agric. Pub. 6.3	Magazines 7.1		
TOTAL 65.1	63.8	60.0	58.3		

Source Type

The classification by source type shows less use of mass media by the earlier adopters than by the later adopters at all stages in the adoption process. The earlier adopters tend to make greater use of agricultural agencies but there is little difference in the use of commercial and no overall trend with respect to informal sources by adopter category. At the awareness stage, laggards show the greatest percentage use of informal sources followed in order by the late majority, innovators, and early adopters, and finally the early majority.

At the evaluation stage, informal sources are used most extensively by innovators and early adopters after which are laggards, late majority, and then the early majority. (TABLE TWENTY-TWO)

Method

Mass methods are used more by later adopters and less by earlier adopters, while the reverse is the case with individual methods. At most stages of adoption individual methods are used least by laggards and most by innovators and early adopters. At the awareness stage laggards use individual methods more than all adopter categories with mass methods ranking next. Laggards, therefore, depend more on the more personal sources for their information at the earlier stages but less later. (TABLE TWENTY-TWO)

Contact

There is generally a greater use of personal sources and a lesser use of impersonal sources by the earlier adopters than by the later adopters. (TABLE TWENTY-TWO)

ADOPTION AND THE USE OF INFORMATION

In a further effort to test the possible significance of information media classified by method and contact, correlation coefficients were computed between adoption and the percentage use of information media in every instance in which data were available. Thus, the use of information media at different stages in the adoption process, for the pre-Chautauqua innovations, for the Chautauqua innovations, and for all use were correlated against adoption by method and contact. A high degree of association was evident only between mass method and the pre-Chautauqua innovations. This was a negative correlation indicating that the slower adopters use a greater proportion of mass methods than do faster adopters. (TABLE TWENTY-THREE)

TABLE TWENTY-TWO

SOURCE USE BY ADOPTER CATEGORIES FOR ALL STAGES IN THE ADOPTION PROCESS

Adopter Category	CLASSIFICATION OF SOURCES BY:									
	T Y P E					M E T H O D				
	Mass Media %	Agric. Agencies %	Commercial %	Informal %	Total %	Mass %	Group %	Individual %	Total %	Personal %
Innovators and early adopters	13.2	43.9	15.6	27.3	100.0	13.2	9.3	77.6	100.0	81.0
Early majority	19.4	44.4	16.5	19.6	100.0	19.4	8.2	72.4	100.0	73.4
Late majority	24.8	30.6	14.9	29.7	100.0	24.8	5.5	69.6	100.0	72.8
Laggards	26.8	29.5	14.2	29.5	100.0	23.2	6.8	70.0	100.0	76.9
Average	21.2	38.1	15.6	25.1	100.0	20.8	7.3	71.9	100.0	73.6
										26.4
										100.0

TABLE TWENTY-THREE

CORRELATION COEFFICIENTS BETWEEN ADOPTION SCORE AND THE
PERCENTAGE USE OF INFORMATION BY METHOD AND CONTACT
FOR ALL INNOVATIONS AND STAGES IN ADOPTION

Informational Category	Information Use			Total of All Informa- tion Use
	by Stages	for Earlier Innovations	for Television Innovations	
Classification by				
<u>METHOD:</u>				
Mass	-.1190	-.1680	-.0394	-.1088
Group	.0034	.0062	.0034	.0045
Individual	.0332	.0535	.0152	.0361
Classification by				
<u>CONTACT:</u>				
Personal	.0235	.0330	.0108	.0237
Impersonal	-.0993	-.1014	-.0244	-.0755

NOTE: The underlined coefficient shows a high degree of association, using the null hypothesis of no association and a .05 level of significance

MOST USED MEDIA

In compiling the percentage use of information media in every situation in which the data were collected, the District Horticulturist is ranked first with 16.9 percent. Following in descending order were: Other Orchardists, 13.7 percent; Summerland Research Station, 9.8 percent; T.V. Chautauqua, 9.2 percent; Magazines, 9.0 percent; B.C. Department of Agriculture Publications, 4.8 percent; Salesmen and Dealers, 4.3 percent; Neighbors, 4.2 percent; District Hall Chautauqua, 4.0 percent; and Cooperatives, 4.0 percent. Here, again, the potential bias introduced by having the District Horticulturists conduct the interviews is evident.

DIFFUSION AND ADULT EDUCATION

It is traditional in adoption research to classify various adult activities conducted for farmers, such as meetings or process demonstrations, in the same class as bulletins and similar information media without distinguishing between diffusion and instructional processes. This procedure tends to obscure the differing effect of instruction and thus oversimplifies the role of adult education in the adoption of innovations.

As an information source, adult education is important. In the present study, the District Hall Chautauqua ranked eighth, meetings and adult education courses ranked ninth, and the District Horticulturist Discussion Groups ranked fifteenth in importance among the twenty-seven sources of information reported. This use of adult education as a source of information is consistent with the reported frequency of participation in these adult education activities as noted earlier, and it varies with the adopter category. Innovators and early adopters showed the highest rate of participation in the three adult education activities and 11.9 percent of this category reported them as sources of information. On the other hand, only 4.2 percent of the laggards reported the three educational activities as a source of information and they also reported the smallest percentage of attendance. The remaining two categories in order were Early Majority with 9.1 percent and Late Majority with 6.9 percent which is consistent with their reported participation pattern.

This analysis of adult education activities solely as sources of information is misleading as it would appear that they are relatively unimportant. As sources of information adult education activities are relatively unimportant but an educational activity does more than provide information and this additional quality is not taken into account. Bulletins and similar sources of information, by their nature, can do little more than present information and make it available to

the farmer. An adult education activity may present information but because it is instructional it also facilitates learning and encourages the use of the information. Thus, the crucial measure is that of participation in adult education and, as indicated earlier, this participation does have a significant relationship to the adoption of innovations. Reducing the educational component, therefore, may not materially affect the diffusion of information but it will affect the ultimate adoption of innovations.

RELATION TO OTHER RESEARCH

The analysis of sources of information in the present study produced data that is not wholly consistent with extant research. This is evident in every dimension of the information of the informational process. As noted earlier, the dimension of source type is somewhat analogous to Rogers' cosmopolite-localite category in which he generalizes that cosmopolite sources are more important for the relatively earlier adopters than for later adopters. Here, however, the earlier adopters tend to use mass media less than do later adopters but agricultural agencies more, while commercial sources show very little difference. Individual sources are used later in the adoption process by earlier adopters but earlier in the process by the later adopters. Earlier adopters tend to depend heavily on the agricultural agencies which in this case includes the District Horticulturist and the various activities which he conducts for orchardists. The later adopters do not have the same personalized relationship with the District Horticulturist and must depend more upon mass media and less on agricultural agencies.

The dimension of contact is analogous with Rogers' category 'personal-impersonal' for which he generalizes that earlier adopters tend to use impersonal sources more than do later adopters. Here, again, the difference is striking. Earlier adopters in the present study tend to use personal contacts more than do later adopters and impersonal contacts less. This difference between the present situation and research elsewhere

is possibly due to the role of the District Horticulturist. By concentrating his energies on the "better" orchardists, the District Horticulturist freezes out the later adopters who do not profit from the traditional personalized service and must rely on the impersonal contacts.

The dimension of method is not considered specifically by Rogers and the result of this analysis is not related to previous research in the same way as the other two dimensions. In this category, earlier adopters tend to use mass methods less than later adopters and individual methods more. Again, this reflects the relationship of the District Horticulturist to his clientele. Group methods are used more by both earlier and later adopters during the earlier stages of the adoption process than they are at later stages. At no stage in the process are group methods used more than mass and individual methods.

CHAPTER FOUR

THE INNOVATIONS

Innovations of one kind or another are introduced to orchardists in the Okanagan Valley continuously. These range from changes in spray chemicals to complex and costly alterations in processing. Previous research indicates that the acceptance or rejection of an innovation is related to certain characteristics inherent in the innovation itself.¹ The five characteristics specified by Rogers include: relative advantage, compatability, complexity, divisibility, and communicability. None of these attributes have been considered in this study, therefore, the data presented about the innovations studied are relevant only to these innovations in this particular setting.

The innovations included in this study were compiled by consulting the technical specialists and representatives of industry concerned with fruit production and marketing in the Okanagan Valley. A list of new practices introduced during the five years preceding was compiled and sifted to eliminate those that were particularly specialized and therefore not appropriate for all growers or else that were excessively costly. Thus, the final list included innovations which were either equal in cost to previous practices or cost saving. Ultimately, six innovations were listed on the interview schedule as follows:

1. Dwarf root stocks.
2. Bulk bin handling of fruit during harvest.
3. Low volume air blast sprayers.
4. Certified nursery stock.
5. Hardy frameworks.
6. Air blast sprayers operating through a power take-off from the tractor.

1. Rogers, op. cit., pp. 121-147.

During the interviews and analysis it was discovered that two of these innovations must be excluded. The bulk bin handling was not a matter left to the discretion of all orchardists as some packing houses would not accept fruit in any other way. Certified nursery stock may be used by growers unknowingly as some nurseries offered only certified stock while others offered the orchardists a choice. The remaining four innovations were used in the analysis and identified as pre-Chautauqua innovations.

A similar list of innovations was compiled from the 1964 T.V. Chautauqua program. These were either introduced for the first time on this program or had so recently been introduced that they were particularly emphasized on the program. This list included the following six innovations:

1. Four way spraying for control of San Jose scale.
2. Spraying of urea and zinc to control powdery mildew on young apple trees.
3. Use of moristan and morocide to control mites.
4. Use of fixed copper sprays for fire blight control.
5. Two by three planting pattern for dwarf apple trees.
6. Pruning for a central leader on semi-dwarf trees in a high density planting.

Items two, four, and five on this list were eliminated from the analysis since they were found not to be appropriate for all members of the sample.

INNOVATIONS AND ADOPTION STAGES

The four innovations introduced in the five years preceding the study were analyzed with respect to stages in the adoption as indicated by the sample population. Sixteen percent were not aware of hardy frameworks and air blast sprayers and fifteen percent were not aware of power take-off sprayers, while only two percent were unaware of dwarfing root stocks¹ At the aware-

-
1. A no-answer response was assumed to indicate lack of

ness, interest, and evaluation stages, power take-off sprayers show a greater percentage of respondents than the average for all innovations while the remaining innovations are close to the average in those three stages.

TABLE TWENTY-FOUR

PERCENTAGE DISTRIBUTIONS OF ADOPTION STAGES FOR THE
PRE-CHAUTAUQUA INNOVATIONS

Innovation	Stage in the adoption process						Total
	0 not aware %	1 aware- ness %	2 inter- est %	3 evalu- ation %	4 trial %	5 adop- tion %	
Dwarfing root stocks	2.1	12.4	12.4	8.3	13.8	51.0	100.0
Low-volume sprayers	14.8	11.7	6.9	13.1	3.4	60.0	100.0
Hardy frame- works	15.9	17.2	4.1	9.0	4.1	49.7	100.0
Power take-off sprayers	15.9	24.8	13.1	19.3	2.1	24.8	100.0
Average	9.7	16.6	9.1	12.4	5.9	46.4	100.0

Chi square value: 85.666.

NOTE: The underlined value is significant. The chi square test was carried out using the null hypothesis of no differences in the distribution of adoption stages between innovations at a .01 level of significance

awareness of an innovation. Since a no-answer could indicate that the respondent was not asked the question, this is a possible source of error. Hopefully, these were all eliminated in processing the forms and in any case, the possible error is not likely to be more than the two percent no-response for dwarfing root stocks.

The trial stage appears to be the least reported stage for all the innovations except dwarfing root stock which showed 13.8 percent compared to four percent or less for the other innovations. This difference may be due to the lack of divisibility inherent in low-volume and power take-off sprayers which is an essential characteristic of an innovation at the trial stage, thereby shortening the trial stage for those two innovations. At the adoption stage, dwarfing root stock and low-volume sprayers had the greatest percentage reporting adoption with hardy frameworks ranking third and power take-off sprayers last. The difference between the 60 percent reporting adoption of low-volume sprayers and the 24.8 percent reporting adoption of power take-off sprayers is considerable, while dwarfing root stock and hardy frameworks at 51.0 percent and 49.7 percent respectively was very close. In the latter case the adoption of one of these innovations is not dependent upon the other, nevertheless, these two are closely related and involve similar considerations by the orchardist which may account for the close proximity of adoption percentages. The distribution among the stages of adoption by innovation is indicated on TABLE TWENTY-FOUR. The Chi square test of this distribution was statistically significant at the .01 level of confidence.

Television Innovations

Among the three innovations from the TV Chautauqua that were analyzed, four-way spraying and moristan/morocide were roughly parallel in their percentage distributions among the adoption stages, although more respondents reported adopting four-way spraying and more were at the interest stage for moristan/morocide. Pruning for a central leader showed the most deviation from the average with more respondents not aware and fewer at the interest and evaluation stages. This distribution tested significant at the .01 level of confidence.

TABLE TWENTY-FIVE
PERCENTAGE DISTRIBUTION OF ADOPTION STAGES FOR THE
TV CHAUTAUQUA INNOVATIONS

Innovation	Stage in the adoption process						Total
	0 not aware	1 aware- ness	2 inter- est	3 evalu- ation	4 trial	5 adop- tion	
Four-way spraying	9.6	44.0	12.8	16.0	0.0	17.6	100.0
Use of moristan and morocide	11.7	38.3	22.5	14.2	1.7	11.7	100.0
Central leader pruning	31.7	47.1	4.8	2.9	1.9	11.5	100.0
Average	16.9	43.0	13.8	11.5	1.1	13.8	100.0
Chi square value:	<u>47.322.</u>						

NOTE: The underlined value is significant.

INNOVATIONS BY ADOPTER CATEGORIES

The innovators and early adopters had the highest percentage of any adopter category at the adoption stage for every innovation. Conversely, for all innovations except power take-off sprayers, the smallest percentage reporting adoption were the laggards. The early majority and late majority follow similar trends for all innovations except for power take-off sprayers. An inverse trend is apparent at the awareness stage where all of the innovators and early adopters are aware of the innovations but seventy percent of the laggards were not aware of power take-off sprayers. Thus, for all innovations the largest percentages at the awareness stage were laggards, while the lowest percentages were innovators and early adopters.

Television Innovations

The TV Chautauqua innovations do not follow the same pattern with respect to the laggards. The largest percentages not aware of each innovation were the laggards, however, at the awareness stage the laggards had the largest percentage aware only of four-way spraying while the late majority had the greater percentage aware of moristan/morocide. Control leader pruning, which had the lowest adoptions of any of the innovations, had approximately the same percentage at the awareness stage in the categories innovators and early adopters, early majority, and late majority. Innovators and early adopters were aware of all innovations.

The pattern of adoption categories by innovations among both the earlier innovations and those presented on the television program appears to indicate that adoption is a generalized trait which is characteristic of individuals. Those adopting one innovation will tend to adopt most innovations and, conversely, there are those who consistently fail to adopt any innovations.

INNOVATIONS AND INFORMATIONAL PROCESSES

Significant differences in the use of information media were obtained between innovations and all dimensions of the informational process. By the classification source type, the most obvious irregularities were in the less than average use of mass media for low-volume sprayers and of commercial and informal types for hardy frameworks. The classification by method showed less than average use of mass and group methods and more use of individual methods for low-volume sprayers. Hardy frameworks, on the other hand, had above average use of mass and group methods with less use of individual methods. In terms of contact, dwarfing root stalks and power take-off sprayers had approximately sixty percent use of personal and forty percent use of impersonal contacts. Low-volume sprayers showed more than average use of personal and less of impersonal

contacts while hardy frameworks had less than average personal and more impersonal contacts.

Television Innovations

The innovations introduced or stressed on the television program had significant Chi square values only with the classification by source-type. Mass media were reported more than average and agricultural agencies less than average for four-way sprayers. Commercial sources were more important for moristan/morocide but were not used at all for central leader pruning.

Individual Rankings

The individual information media were tabulated for each innovation and ranked in order of frequency. The District Hall Chautauqua played an important role in three of the four earlier innovations, while salesmen and dealers were important for the two innovations involving sprayers. 'Other orchardists' ranked highest in use for the earlier innovations as a whole, followed in turn by Summerland Research Station, District Horticulturists, Magazines, and the District Hall Chautauqua.

Information media perform different functions with respect to different innovations. No attempt has been made to analyze further the relationship between innovations and the various media. Furthermore, no attempt has been made to relate these particular innovations to extant research.

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CHAPTER FIVE

THE TV CHAUTAUQUA

After nearly fifty years of using it, the Department of Agriculture sought a different method of diffusing information in the Okanagan Valley than the District Hall Chautauqua which was "...a long difficult series and expensive as well."¹ Since television had been used by local District Horticulturists since April, 1958 for regular programs for orchardists, the Branch decided to try a televised Chautauqua as a substitute for the District Hall program. The first experiment was held during the week of January 28th to February 1st in 1963. This program ran for five successive days from nine to ten-thirty in the morning. The same format was repeated in 1964 during the week of January 27th to 31st but the time was changed to the period from eight-thirty to ten o'clock. The mornings from Monday through Thursday were devoted to pest control, what to plant, and to apple and peach maturity and harvest. Friday was spent in answering questions which viewers had raised by telephone to the television station.

To study this program in some detail, specific data were collected from the sample members who watched the program. This would help to identify the audience, assess participation by orchardists, measure their attitude to the program, and evaluate the effectiveness of the program as a source of information. In addition, the program format could be studied with respect to length and general design. Since adopter categories had been established on the basis of early innovations it would be possible to identify more precisely the influence exerted by the television program on segments of the target audience.

1. A.C. Carter, "Report of the 1963 Televised Chautauqua." Unpublished report, B.C. Department of Agriculture, Horticultural Branch, June, 1963. p.2.

THE AUDIENCE

Among the respondents in the sample, 92.4 percent reported owning a television set in working order; however, only 60.7 percent watched at least part of the 1964 TV Chautauqua. Participation in this program was slightly less than the 63.4 percent of the sample which reported attendance at the District Hall Chautauqua. Since this difference is not statistically significant at the .05 level, we cannot conclude from the sample that more orchardists actually attended the local community programs than watched the equivalent on television. Thus, television was neither better nor worse than the District Hall meetings in attracting and reaching the target population.

TABLE TWENTY-SIX

DISTRIBUTIONS OF RESPONDENTS BY ADOPTER CATEGORY
ATTENDING VARIOUS COMBINATIONS OF CHAUTAUQUAS

Chautauquas	Innovation and early adopters	Early majority	Late majority	Lag- gards	Total
	%	%	%	%	%
Both	80.0	59.3	30.4	10.0	46.2
Attending district hall chautauqua only	5.0	15.3	26.1	15.0	17.2
Watching 1964 TV chautauqua only	0.0	10.2	19.6	30.0	14.5
Neither	15.0	15.3	23.9	45.0	22.1
Total	100.0	100.0	100.0	100.0	100.0

Chi square value: 33.985

NOTE: The underlined value is significant. A .05 level of significance was used with the null hypothesis of no differences in proportions between adopter categories.

Participation in both types of Chautauquas was reported by 46.2 percent of the sample. Participation in the District Hall Chautauqua only was reported by 17.2 percent and in the television program only by 14.5 percent. No participation in either type was indicated by 22.1 percent. There were no statistically significant differences at the .05 level between those who attend the District Hall program and those who watched the television program in terms of socio-economic characteristics.

There is a positive correlation between adoption score and participation in either type of program. More of the innovators and early adopters attended both events than was found to be true of the other adopter categories. Conversely, more laggards did not participate in either event; however, twice as many laggards watched the television program than attended the district meetings.

TV Participation and Other Educational Activity

Participation in the two types of Chautauqua programs was related to participation in other kinds of educational activities. Participants in the two chautauquas also attended the local discussion groups more frequently, while those who participated in neither attended the discussion groups less frequently. Those who attended the District Hall Chautauqua only attended more adult education courses in subjects other than agriculture than did most respondents. These differences were statistically significant at the .05 level of confidence. (TABLE TWENTY-SEVEN)

Participation in the District Hall Chautauqua and in the televised program is related to adopter category. Both events were attended by 80.0 percent of the innovators and adopters and this was greater than the attendance from other adopter category. The early majority and the late majority in that order show a greater attendance at both events than do the

TABLE TWENTY-SEVEN
ATTENDANCE AT OTHER EDUCATIONAL EVENTS VERSUS
ATTENDANCE AT THE CHAUTAUQUAS

Chautauquas attended or viewed	PERCENT ATTENDING				District horticul discus. groups
	Agriculture High School	Courses Univer- sity	Adult in agric.	Courses in other subjects	
Both	13.8	14.8	14.3	30.2	85.1
District hall chautauqua only	12.0	4.8	16.7	78.2	64.0
1964 T.V. chautauqua only	19.0	0.0	10.5	38.1	52.4
Neither	15.6	0.0	9.4	32.3	28.1
Average	14.7	7.7	13.0	39.9	64.1
Chi square value:	.515	<u>8.516</u>	.680	<u>17.300</u>	<u>31.972</u>

NOTE: Underlined values are significant. The null hypothesis used was there were no differences in attendance at each course, etc. between the respondents classified on the basis of their attendance or viewing of the chautauquas. A .05 level of significance was used.

laggards. Laggards, however, had greater attendance at the television program only than did the other adopter categories and this is also the case with respect to attendance at neither event. By adopter category, therefore, participation in adult education declines through the adopter categories while lack of participation increases through the categories. The earlier the adoption the greater the participation and, conversely, the lower the adoption the lower the percentage of participation in adult education. These data are statistically significant at the .05 level.

Differential Characteristics

The orchardists who participated in the televised Chautauqua differed from those who did not with respect to certain of the socio-economic characteristics studied. These differences were statistically significant at the .05 level. The television participants got more enjoyment from orcharding than the non-participants with 86.4 percent indicating that they enjoyed orcharding very much while 68.4 percent of the non-participants indicated this. Of the participants, 80.7 percent were full-time orchardists but only 29.8 percent of the non-participants were full-time orchardists. Furthermore, 71.2 percent of the participants reported no income from sources other than agriculture as against 28.1 percent. The participants had larger orchards and greater sales of orchard products than non-participants. Of those who watched the television program, 39.5 percent had an unfavourable regard for orchardists who were slow in adopting new practices, while 21.9 percent of the non-watchers regarded them unfavourably. None of the other socio-economic characteristics showed significant differences between those who did and those who did not participate in the televised program.

THE PROGRAM

In order to evaluate the television program itself apart from its relationship to adoption, data were collected that would measure the participants' attitude about the program; measure the amount of content material remembered after a time lapse; and that would appraise the general format of the program as presented.

Attitude Measurement

An attitude scale of the Thurstone type was used to assess reaction to the television program by the viewers. This scale had been developed earlier to measure general attitudes about

an educational program.¹ This scale contains twenty statements with the lower numbered items having the highest value and, thereby, reflecting a more favorable attitude toward the program. The scale was modified to suit this specific group by substituting the word orchard for the word program in the scale item four.² The scaled average response was close to scale statement three while the median response was statement four. This response indicated that the television program was received favorably by those who watched it. They felt that it provided them with useful information and they would like to see another program next year.

Content Measurement

A test was constructed that would measure the amount of content material remembered after a lapse of some ten weeks. Since delayed remembering is better through recognition than through recall, true-false statements were used.³ Each question related to a specific item of information presented on the program and the split half coefficient of reliability was .747. When adjusted by means of the Spearman-Brown formulae for the whole test the reliability coefficient became .849. Since the televised Chautauqua consisted of five daily programs of one and one-half hour duration each, three questions were formulated from the content of each half-hour of the program or nine per day for a total of forty-five items on the test.

The ten week lapse between the program and the research interview during which the test was administered should have

1. Russel P. Kropp and Coolie Verner, "An Attitude Scale Technique for Evaluating Meetings." Adult Education 7:212-215. (Summer, 1957).

2. This slight modification was found to be immaterial with respect to the scale value. See: John M. Welch and Coolie Verner, "A Study of Two Methods for the Diffusion of Knowledge." Adult Education, 12:231-237. (Summer, 1962).

3. Ian M.L. Hunter, Memory: Facts and Fallacies. London: Penguin Books, 1957. pp 15ff.

allowed time for some of the information from the program to have been diffused among those who did not watch the program so the test was given to every person in the sample rather than to just those who had watched the program. This diffusion of information by personal contact is cited frequently in adoption research as one of the chief ways through which knowledge is spread among farmers.¹ The differences between the total score on the test of those who did and did not watch the television program were tested and a statistically significant difference at the .05 level was found. The average test score for respondents watching at least part of the television program was 27.701 and for those not watching, the average was 24.682. In comparing the means of the two groups, an F value of 6.132 was found which is significant at the .05 level. Among those who watched the program, the amount of time watched did not affect the score.

These data suggest that in the time allotted personal influence was not an effective channel for the diffusion of information in this population as a result of this type of educational activity. This is consistent with related findings from research among a different occupational group in which a different educational process was used.² (TABLE TWENTY-EIGHT).

In comparing scores on the test by adopter categories, the faster adopters had higher scores than did slower adopters. The average score for innovators and early adopters was 31.7, while that for laggards was 21.4. The mean scores by adopter categories were tested and a significant difference was found at the .05 level of confidence.³ A further test was made in which the test scores were correlated with the percentage of

1. Diffusion by personal influence is also measure to some extent by the analysis of informational processes discussed in Chapter Three through the categories: informal, individual and personal. See also: Eilson and Gallop, op. cit.; Rogers, op. cit., pp. 217ff; and Lionberger, op. cit. p. 46.

2. Welch and Verner, op. cit. This study of restaurant operators found virtually no diffusion of information from a workshop between those who attended and those who did not.

3. The F value was 11.442

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means for each day were found to be significant at the .05 level of confidence.¹ The lower than average score on Tuesday is a curious anomaly that may be due to the fact that the 53.0 percent of the respondents participating that day was the largest of any day. On Friday the lowest percentage of participation was reported at 47.5 percent. The differences in percentage participation by day of the week were not significant.

TABLE TWENTY-NINE
MEAN SCORE BY PROGRAM SEGMENT

Program	Total	Program segment			F value
		First half-hour	Second half-hour	Third half-hour	
Monday	5.99	1.64	2.01	1.91	<u>5.434</u>
Tuesday	5.08	1.50	1.47	1.85	<u>7.242</u>
Wednesday	5.63	2.24	1.54	1.82	<u>17.076</u>
Thursday	5.41	2.39	1.34	1.64	<u>56.316</u>
Friday	5.68	1.98	1.61	1.70	<u>6.236</u>

NOTE: Underlined values are significant. A null hypothesis of no difference between means was used at a .05 level of significance.

Significant differences were found when the mean scores were compared by program segments. On Wednesday, Thursday, and Friday, the highest average scores were obtained on those questions based on the first half-hour segment. The mean score for the first segment on these days tested significantly better than the second and third half-hour segments, while on Wednesday and Thursday but not on Friday the last half-hour segment was significantly better than the middle. Monday and

1. The F value was 4.064.

Tuesday were both maverick days. On Monday, the second half-hour had the highest average score of the three segments and the mean score for that segment was significantly better than the first half-hour but not significant when tested against the last half-hour. The last half-hour on Tuesday had the highest average score while the mean score for that segment tested significant when compared with the rest of the program that day. This divergent pattern on Tuesday may be related to the higher percentage of participants and to the fact that it had the lowest average score of any day. These data suggest a compatability of the television program with the conclusions reached by Trenamen as noted earlier.

Among the respondents who expressed an opinion, 88.5 percent thought that the length of the program was suitable, 94.6 percent thought the time of year satisfactory, and 68.7 percent found the time of day convenient. Although the format of the program appears to have been acceptable to the orchardists, it was unnecessarily long. One hour would accomplish as much learning as the one and one-half hours used on the program.

TELEVISION AND DIFFUSION

The Provincial Department of Agriculture introduced the TV Chautauqua as a substitute for the earlier District Chautauqua which had been operated for a number of years. The time interval between the television program and the research interviews was so short that few respondents had reached the adoption stage for the three innovations studied; therefore, it is not possible to compare the two types of activities in terms of adoption. Those respondents who had participated in the television program were definitely further along in the adoption process than were those who had not. All of the innovators and early adopters were aware of the innovations introduced while the largest percentage of those not aware were laggards.

The TV Chautauqua was, needless to say, the most important single information medium for all the innovations which it introduced or stressed. As a source of information the television program was listed by 32.0 percent of the respondents followed in order by magazines at 9.8 percent, D.C. Department of Agriculture publication, 9.1 percent, and other orchardists at 7.2 percent. This distribution differed considerably from that reported for the innovations introduced prior to the television program as noted previously.

Television contacted 14.5 percent of the orchardists who had not participated in the District Hall Chautauqua and it contacted twice as many laggards as had previously attended local meetings. Among those watching the television program only, there were more laggards than from any other adopter category, nevertheless, 45.0 percent of the laggards were not participants of either type of program.

Earlier adopters retained more of the information presented on the television program than did later adopters. Thus, although television is an effective way of making orchardists aware of new practices it is not necessarily an effective substitute for the continuing instructional activities of the Department of Agriculture. In view of the significant relationship between adoption and adult education any dependence solely upon television is likely to be detrimental to the sustained rate of adoption.

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CHAPTER SIX

CONCLUSIONS

The orchardists in the Okanagan Valley are much like the farmers that have been studied elsewhere insofar as their adoption behavior is concerned. In certain ways this particular population differs from that studied in the United States but the differences are not sufficient to suggest that the Canadian agricultural population is distinctively different. The similarities are greater than the differences when the data examined in the present study are compared with similar research elsewhere.

ORCHARDISTS AS ADOPTERS

Those orchardists who tend to adopt innovations earlier or more rapidly have certain common characteristics which differentiate them from those who are slower to adopt. The principal distinguishing characteristics are that earlier adopters have a better than average economic status and a higher than average participation in educational programs. Age per se, is not an important characteristic and neither are years of school completed, tenure, community participation, or community perception.

The measures of economic status are consistently weighted in favor of the earlier adopters. This group tends to have better than average sales value of orchard products and of the value of the total enterprise operated by them also tends to be larger. Slower adopters fall below the average on these measures. The earlier adopters are apt to be full-time orchardists who derive the greater portion of their income from their orchards. The slow adopters, on the other hand, are more apt to work elsewhere and to derive a portion of their total income from other sources. The study does not tell us whether these economic differences result from earlier adoption or whether

orchardists adopt new innovations earlier because of their better economic position. Earlier adopters have more years of experience both in orcharding and on their present orchards than the average while later adopters have less.

The earlier adopters show a marked inclination to be better than average participants in every educational activity made available to them while the later adopters show a below average participation in such things. The earlier and later adopters show distinctive differences in their use of information sources. Earlier adopters make greater use of mass media and agricultural agencies than do the average while their dependence upon personal contact is greater. They use mass methods less and group methods slightly more than do the average. Slower adopters, on the other hand, depend more on mass media and less on personal contacts, agricultural agencies, or group methods than do the average. It is in the use of information sources that distinctive differences are apparent between this population and that studied elsewhere. This difference results, no doubt, from the more personalized services provided the better orchardists by the District Horticulturists in the Okanagan Valley. This close relationship is clearly indicated by the data presented here and while this is favorable to the earlier adopters it tends to work against the later adopters. Again, this study cannot tell us if earlier adopters receive more attention because they are more successful or if they are more successful because they receive more personal service. Perhaps the later adopters would adopt faster and become economically better fixed if they received more attention from the District Horticulturists.

INTERRELATIONSHIPS OF CERTAIN CHARACTERISTICS

There are certain socio-economic variables studied that have significant relationships with other variables. Age, for example, is significantly related to years in agriculture and to years on the present orchard. Those longest in agriculture,

however, tend to have a lower educational level. Active participation in adult education is related to higher adoption percentage and to the enjoyment of orcharding. The better educated belong to more organizations but attend less even though organizational membership is related to attendance and to offices held. Attendance, on the other hand, is related to contributions and to committee membership while the latter is related to offices held. Orchardists holding more offices belong to more organizations, serve on more committees, tend to have larger operations, and to have higher value of orchard products sold. Contributions to organizations relates only to attendance but, curiously, those who participate more in adult education contribute less to organizations.

Those longest in agriculture tend also to have been in orcharding longer, to be older, and to have a lower educational level. Those who have been longer in orcharding have been on their present orchards longer and to have higher sales of orchard products. The size of the enterprise is related to the number of acres in orchard, to the total value, and to the number of offices held while the number of acres in orchard is related to higher values from the sale of orchard products. Thus, those with higher sales value tend to have larger and more valuable operations, receive more of their income from orcharding, adopt new innovations faster, and hold more offices in local organizations.

The most important characteristics with respect to adoption percentage indicate that the higher adopters participate more in adult education, have higher sales of orchard products, and contribute more to community organizations.

EDUCATION AS A FACTOR IN ADOPTION

The concept educational level as measured by years of school completed usually shows no relationship to adoption and thus education is considered not to be a significant factor.

Such is the case in this study. Furthermore, educational level was not significantly related to any of the variables which were important to adoption. If we examine specific aspects of schooling as was done here, however, there is a significant relationship to adoption with respect to agricultural courses at university. This suggests that there are several dimensions to education that need to be examined separately. Adult education is one such dimension.

Adult education is not ordinarily considered specifically in adoption research as a variable related to adoption percentage. In this study, certain adult education activities were sufficiently clear cut and specific to be measured independently. Ordinarily, such activities are included as one of a number of potential sources of information on the assumption that they would function only as sources of information with respect to adoption. When this is done, as it was in the present study, adult education is not an important source of information. When participation in adult education is tested independently, however, its true relationship to adoption becomes apparent.

These data suggest that recency of educational experience and the direct relevance of the content to the primary concerns of the given group are the crucial attributes of education. Furthermore, participation in one kind of educational event leads to participation in other such activities. In view of the significant relationship of adult education to adoption, an increase in systematic educational activities would enhance the increased rate of adoption of new innovations among farmers.

TELEVISION AND ADOPTION

Television can be an effective medium for informing agricultural populations about innovations or altered practices but like other information sources it is more effective with the earlier than with the later adopters. It does reach more laggards than anything else even up to twice as many; however, it is primarily effective only at the awareness stage in the adoption process. Certainly, television is not an adequate substitute for systematic adult education.

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1964 SURVEY OF OKANAGAN VALLEY ORCHARDISTS

INSTRUCTIONS to Interviewers

1. Interview only the manager or operator of the orchard.
2. Please use wording given in the questionnaire.
3. Ask all questions in the order they appear.
4. If a respondent refuses to answer a question, make a note to that effect in the margin.
5. Each respondent must be visited at least 3 times before using an alternate. At least one of the first three visits must be in the evening.

Respondent's Name: _____

Address: _____

Record of Calls:

	<u>Date</u>	<u>Time</u>	<u>Results or Comments</u>
1st	_____	_____	_____
2nd	_____	_____	_____
3rd	_____	_____	_____
4th	_____	_____	_____

Notes:

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INTRODUCTION

Hello, I'm _____ from the British Columbia Department of Agriculture. We're conducting a survey of orchardists in the Okanagan Valley, and I would like to ask you some questions about yourself and your orchard. All information you give me will be strictly confidential, and will be used for statistical summaries only.

A. TO START, I'D LIKE TO ASK A FEW QUESTIONS ABOUT YOURSELF.

1. What is your age?

1. less than 20		1.	1
2. 20 - 24			2
3. 25 - 34			3
4. 35 - 44	(circle one)		4
5. 45 - 54			5
6. 55 - 64			6
7. 65 or over			7

2. What is the highest year you finished in school?

1. less than 5		2.	1
2. 5 - 8			2
3. 9 - 11			3
4. high school diploma (grade 12)	(circle one)		4
5. senior matriculation			5
6. university degree			6
7. university graduate work			7

3. Have you taken any agriculture courses?

- in high school?		3.	1
1. yes			2
2. no			
- at university?		4.	1
1. yes			2
2. no			

4. Have you taken any adult courses?

- in agriculture		5.	1
1. yes			2
2. no			
- in other subjects		6.	1
1. yes			2
2. no			

5. Did you attend the Orchardists' Chautauqua when it was held regularly in district halls?

1. yes		7.	1
2. no			2

6. Do you attend discussion groups with your district horticulturist and other orchardists?

1. yes		8.	1
2. no			2

- | | |
|---|-------------|
| 7. Do you enjoy your work as an orchardist? | |
| 1. very much | 9. 1 |
| 2. occasionally | 2 |
| 3. not at all | 3 |
| 8. Do you subscribe to a local newspaper or newspapers? | |
| 1. yes | 10. 1 |
| 2. no | 2 |
| 9. Do you regularly receive any farm magazines or magazines other than "Country Life"? | |
| 1. yes | 11. 1 |
| 2. no | 2 |
| 10. How many organizations do you belong to? | 12,13. ____ |
| 11. How many organizations do you attend at least once a year? | 14,15. ____ |
| 12. To how many organizations do you make a contribution for support? | 16,17. ____ |
| 13. How many committees of these organizations do you belong to? | 18,19. ____ |
| 14. How many offices of these organizations do you hold? | 20,21. ____ |
| 15. How many years have you been working in the agricultural industry? | |
| 1. less than 5 | 22. 1 |
| 2. 5 - 9 | 2 |
| 3. 10 - 19 | 3 |
| 4. 20 or over | 4 |
| 16. How many years have you been an orchardist? | |
| 1. less than 5 | 23. 1 |
| 2. 5 - 9 | 2 |
| 3. 10 - 19 | 3 |
| 4. 20 or over | 4 |
| 17. How many years have you been on the present orchard? | |
| 1. less than 1 | 24. 1 |
| 2. 2 - 5 | 2 |
| 3. 5 - 9 | 3 |
| 4. 10 - 19 | 4 |
| 5. 20 or over | 5 |
| 18. Is fruit-growing your full-time or part-time occupation? (if full time, circle 1)
If part-time, what is your full-time occupation? _____ | 25. 1 |
| | 2 |
| | 3 |
| | 4 |
| | 5 |
| | 6 |

B. NEXT, I'D LIKE TO ASK ABOUT YOUR ORCHARD:

1. What is the total size of this enterprise, in acres?
 1. less than 3
 2. 3 - 9
 3. 10 - 19
 4. 20 - 39
 5. 40 - 54
 6. 55 - 69
 7. 70 - 179
 8. 180 or more
2. How many acres do you have in orchard?
 1. less than 3
 2. 3 - 9
 3. 10 - 19
 4. 20 - 39
 5. 40 - 54
 6. 55 - 69
 7. 70 - 179
 8. 180 or more
3. What would you pay for this enterprise to own and operate it?
 1. under \$4950
 2. \$4950 - \$9949
 3. \$9950 - \$14,949
 4. \$14,950 - \$24,949
 5. \$24,950 - \$49,949
 6. \$49,950 - or over
4. Do you rent this orchard, own part and rent part of it, or own it entirely?
 1. rent
 2. both (. acres owned, acres rented)
 3. own
5. Do you have income from sources other than your orchard and farming operations? If so, how is this income related to your income from agriculture?
 1. no income from other sources
 2. half as much or less
 3. less than, but greater than half as much
 4. equal to
 5. greater, but less than twice as much
 6. twice as much or greater
6. What was your total value of orchard products sold in 1962?
 1. nil
 2. less than \$1200
 3. \$1200 - \$2499
 4. \$2500 - \$3749
 5. \$3750 - \$4999
 6. \$5000 - \$9999
 7. \$10,000 - \$14,000
 8. \$15,000 - \$24,999
 9. \$25,000 and over,

26. 1
2
3
4
5
6
7
8

27. 1
2
3
4
5
6
7
8

28. 1
2
3
4
5
6

29. 1
2
3

30. 1
2
3
4
5
6

31. 1
2
3
4
5
6
7
8
9

C. I NOW HAVE SEVERAL QUESTIONS ABOUT YOUR COMMUNITY:

1. How willing is this community to adopt new farm practices?
 1. willing 32. 1
 2. about average 2
 3. not very willing 3
2. How does this community regard people who try many new practices?
 1. favourable 33. 1
 2. no feeling 2
 3. not favourable 3
3. How does this community regard people who are slow in adopting new orchard practices?
 1. favourable 34. 1
 2. no feeling 2
 3. not favourable 3

D. (HAND RESPONDENT BLUE CARD):

On side one of this card you will see a number of sources of possible information about improved orchard practices. In answering the next few questions, I want you to give me the number or numbers only of the source or sources which best answer the questions. (enter numbers in right-hand margin).

1. What source or sources have you found to be most useful in finding out about new or improved practices which you can apply profitably in your orchard? 35,36. _____
37,38. _____
39,40. _____
2. When you have found an item about a new or improved practice which interests you, to which source or sources do you go for further information on how you can possibly apply it in your orchard? 41,42. _____
43,44. _____
45,46. _____
3. When you have received information on a new or improved practice, which source or sources do you use to help you evaluate the information acquired in the light of the existing conditions into which the practice would have to fit? 47,48. _____
49,50. _____
51,52. _____
4. After you have weighed the information available, what source or sources do you use in finding information on how to apply the practice? 53,54. _____
55,56. _____
57,58. _____
5. When you have found out how to apply the practice, which source or sources do you use in deciding whether or not to adopt the practice? 59,60. _____
61,62. _____
63,64. _____
6. I will now read to you some orchard practices recommended in the past few years. I want you to tell me whether you are aware of each of these practices. If so, what progress, if any, have you made towards the adoption of each. Also, what sources of information have you used in working towards the adoption of each of these practices.

<u>Stage of Adoption</u>	<u>Score</u>	<u>Definition</u>
Awareness	1	The first knowledge about a new practice
Interest	2	The active seeking of extensive and detailed information about the idea to determine its possible usefulness and applicability
Evaluation	3	Weighing and sifting the acquired information and evidence in the light of the existing conditions into which the practice would have to fit
Trial	4	The tentative trying out of the practice, accompanied by acquisition of information on how to do it
Adoption	5	The full-scale integration of the practice into the on-going operation

Recommended Practices and Sources of Information

(In the right-hand margin opposite each practice, enter the appropriate score. Enter the number(s) of the source(s) of information in the right-hand margin also)

1. Dwarfing root stocks:
Sources of information used: 65. _____
66,67. _____
68,69. _____
70,71. _____
2. Bulk bin handling of fruit during harvest:
Sources of information used: (START DATA CARD NO. 2) 72. _____
1,2. _____
3,4. _____
5,6. _____
3. Low volume air-blast sprayers:
Sources of information used: 7. _____
8,9. _____
10,11. _____
12,13. _____
4. Certified nursery stock:
Sources of information used: 14. _____
15,16. _____
17,18. _____
19,20. _____
5. Hardy frame works:
Sources of information used: 21. _____
22,23. _____
24,25. _____
26,27. _____
6. Air-blast sprayers operating through power take-off from the tractors:
Sources of information used: 28. _____
29,30. _____
31,32. _____
33,34. _____

E. FINALLY, A FEW QUESTIONS ABOUT THE RECENT
T.V. CHAUTAUQUA:

1. Do you have a television set in working order?

1. yes
2. no

35. 1
2

2. Did you watch this year's T.V. Chautauqua?

1. yes
2. no

36. 1
2

3. If no, why not? _____

(If "no" answer to question 2, omit questions 4, 5, 6 & 8)

4. On which days did you watch the program?

Monday 1. yes
2. no

37. 1
2

Tuesday 1. yes
2. no

38. 1
2

Wednesday 1. yes
2. no

39. 1
2

Thursday 1. yes
2. no

40. 1
2

Friday 1. yes
2. no

41. 1
2

5. For how long each day:

1. all
2. at least one hour
3. at least one-half hour
4. less than one-half hour

42. 1
2
3
4

6. Who regularly watched the program with you?

1. nobody
2. family member
3. employee
4. other orchardist
5. partner
6. other

43. 1
2
3
4
5
6

7. I will now name several orchard practices recommended very recently. I want you to tell me if you are aware of these practices and what progress, if any, you have made towards their adoption. Also, what sources of information have you used in working towards adoption of each of these practices?

<u>Stage of Adoption</u>	<u>Score</u>	<u>Definition</u>
Awareness	1	The first knowledge about a new practice
Interest	2	The active seeking of extensive and detailed information about the idea to determine its possible usefulness and application
Evaluation	3	Weighing and sifting the acquired information and evidence in the light of the existing conditions into which the practice would have to fit
Trial	4	The tentative trying out of the practice, accompanied by acquisition of information on how to do it
Adoption	5	The full-scale integration of the practice into the on-going operation

Recommended Practices and Sources of Information

(In the right-hand margin opposite each practice, enter the appropriate score. Enter the number(s) of the source(s) of information in the right-hand margin also).

1. Four-way spraying for the control of San Jose scale: 44. _____
Sources of information used: 45,46. _____
47,48. _____
49,50. _____
2. Spraying of Urea and Zinc to control powdery mildew on young apple trees: 51. _____
Sources of information used: 52,53. _____
54,55. _____
56,57. _____
3. Use of Moristan and Morocide to control mites: 58. _____
Sources of information used: 59,60. _____
61,62. _____
63,64. _____
4. Use of fixed copper sprays for fire blight control: 65. _____
Sources of information used: 66,67. _____
68,69. _____
70,71. _____
5. Two by three planting pattern for dwarf apple trees: 72. _____
Sources of information used: (START DATA CARD NO. 3) 1,2. _____
3,4. _____
5,6. _____

6. Pruning for a central leader on semi-dwarf trees in a high-density planting:

Sources of information used:

7. _____
8,9. _____
10,11. _____
12,13. _____

7. Which of the statements on side two of the blue card most accurately describes your personal reaction to the T.V. Chautauque?

14,15. _____

(HAND RESPONDENT YELLOW CARD):

8. Which of these statements are true and which false?
(circle 1 for true and 2 for false)

Statement 1	16.	1	Statement 16	31.	1	Statement 31	46.	1
		2			2			2
2	17.	1	17	32.	1	32	47.	1
		2			2			2
3	18.	1	18	33.	1	33	48.	1
		2			2			2
4	19.	1	19	34.	1	34	49.	1
		2			2			2
5	20.	1	20	35.	1	35	50.	1
		2			2			2
6	21.	1	21	36.	1	36	51.	1
		2			2			2
7	22.	1	22	37.	1	37	52.	1
		2			2			2
8	23.	1	23	38.	1	38	53.	1
		2			2			2
9	24.	1	24	39.	1	39	54.	1
		2			2			2
10	25.	1	25	40.	1	40	55.	1
		2			2			2
11	26.	1	26	41.	1	41	56.	1
		2			2			2
12	27.	1	27	42.	1	42	57.	1
		2			2			2
13	28.	1	28	43.	1	43	58.	1
		2			2			2
14	29.	1	29	44.	1	44	59.	1
		2			2			2
15	30.	1	30	45.	1	45	60.	1
		2			2			2

10. Is the time of the year that the T.V. Chautauque is held suitable?

1. yes
2. no

61. 1
2

11. Is the time of day suitable?

1. yes
2. no

62. 1
2

12. Is the length of the program suitable?

1. yes
2. no

63. 1
2

13. Any other comments on the T.V. Chautauque?
(note any remarks on questions 10, 11 and 12)

SOURCES OF INFORMATION

Number	Source
01	Newspapers
02	Magazines
03	Radio
04	T.V.
05	T.V. Chautauqua
06	Summerland Research Station
07	Chautauqua in district halls
08	Discussion groups with district horticulturist
09	Agricultural meeting
10	Co-Operative
11	University of B.C.
12	Vocational Agriculture Courses
13	Adult Education Courses
14	University courses in agriculture
15	B.C. Department of Agriculture publications
16	Federal Department of Agriculture publications
17	B.C. Tree Fruits Ltd.
18	B.C. Fruit Growers Association
19	Salesmen or dealers
20	District horticulturist
21	Employees
22	Vocational agriculture teacher
23	Neighbours
24	Other orchardists
25	Wife
26	Children
27	Other

STATEMENTS DESCRIBING REACTION
TO T.V. CHAUTAUQUA

- 01 It was one of the most rewarding experiences I have every had.
- 02 It was exactly what I wanted.
- 03 I hope we can have another one next year.
- 04 It has provided the kind of information I can use in my orchard.
- 05 It has helped me personally.
- 06 It has solved some problems for me.
- 07 I think it served its purpose.
- 08 It has some merits.
- 09 It was fair.
- 10 It was neither very good nor very poor.
- 11 I was mildly disappointed.
- 12 It was not exactly what I needed.
- 13 It was too general.
- 14 I did not get any new ideas.
- 15 It didn't hold my interest.
- 16 It was much too superficial.
17. I was dissatisfied.
- 18 It was very poorly planned.
- 19 I didn't learn a thing.
- 20 It was a complete waste of time.

TRUE OR FALSE QUESTIONS

1. Collar rot infection only occurs when soil is above saturation point.
2. No chemical spray kills 100% of insects.
3. When spraying, a grower should use as small a dosage as possible.
4. The air velocity in a concentrate sprayer should be less than 100 miles per hour.
5. Cyprex is an outstanding scab fungicide.
6. San Jose scale is controlled by spraying from two directions only.
7. When spraying from four directions, half as much insecticide must be used when spraying from two directions.
8. Dormant sprays have no effect against powdery mildew fungus.
9. Peach leaf curl can be controlled by spraying before the buds open.
10. The best time to control European Red mite is at the pink bud stage.
11. Brown Rot does not occur in all stone fruits.
12. Kelthane, when applied in the summer, is effective against European Red mite eggs.
13. Brown Rot occurs every year in the Okanagan Valley normally.
14. Copper sprays will prevent fireblight from spreading in a fruit tree.
15. Fireblight can be controlled in the summer by increasing the moisture level.
16. Morocide spray cannot be applied within 60 days of harvest.
17. The best time to use sprays in the control of mites is after they move to the outer parts of the tree.
18. Healthy, vigorous stone fruit trees encourage attack by borers.
19. The B.C. Tree Fruits quality control program has been poorly accepted by the growers.
20. The pressure test is good for testing the storage life of an apple.
21. Apple picking should be done on the basis of fruit colour only.
22. The chief sign of maturity trouble in peaches is a high cullage rate.
23. The cullage rate on the Red Haven variety of peach has increased in the last two years.

(True or False Questions con'd)

24. New varieties of peaches hold little promise.
25. A normal size peach tends to flatten out under its own weight in the carton.
26. An oversize peach should be picked on the hard side.
27. A great deal of the cullage problem with peaches occurs during harvesting.
28. The planting of some varieties of peaches is recommended.
29. It is recommended that no further plantings of cherries be made.
30. Further plantings of the Red Delicious variety of apples are not recommended.
31. Smaller size trees increase the cost of production.
32. It is important economically to have varieties of nectarines that will ripen in August.
33. Trees are automatically certified after having been colour coded in the certified budwood scheme.
34. The shading effect which a tree has on itself is an unimportant factor in limiting production.
35. When first planting a site a grower should plant twice or three times the number of trees which he will need eventually.
36. Standard size trees have less leaf area per acre than dwarf trees.
37. The pump pressure has a significant effect on the efficiency of spray machines.
38. The best time to start blossom thinning peaches is when the blossoms are first showing colour.
39. The hole-shot borer is encouraged by leaving prunings in the orchard.
40. There is room for more plums on the fresh market.
41. The future for crab-apples looks very promising.
42. The symptoms for boron deficiency and boron toxicity are quite different.
43. Spraying water at night will improve the colour of MacIntosh apples.
44. Dormant spraying carried out four ways for San Jose scale will not control blister mite.
45. Wood shavings are not useful for conserving moisture around young trees.

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